Field Manual
NO. 1-111

FM 1-111

AVIATION BRIGADES

CONTENTS

SECTION I. Logistics Principles

SECTION II. Army Logistics SupportGroups, Elements, And Commands

SECTION III. Supply Operations

SECTION IV. Maintenance Operations

Unless otherwise stated, when the masculine gender is used, both men and women are included.

This publication has been reviewed for OPSEC considerations.

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

PREFACE

The operational concepts in this manual are based on Army doctrine as established in FM 100-5, *Operations*, and FM 1-100, *Army Aviation Operations*.

FM 1-111 is a doctrinal guide for employing aviation brigades in combat operations and stability and support operations (SASO). It describes echelon above corps (EAC), corps, and division aviation brigade organizational structures within the framework of the Aviation Restructure Initiative (ARI). It also describes battle command, joint and combined arms operations, and combat service support.

Appendix A discusses considerations for attaching ground forces to the aviation brigade. Appendix B discusses risk management. Appendix C describes aviation operations in a nuclear, biological, and chemical (NBC) environment. Appendix D provides the framework and planning considerations for conducting combat search and rescue (CSAR) operations. Appendix E addresses planning considerations for the deployment of aviation units. Appendix F addresses SASO (formerly operations other than war [OOTW] or military operations other than war [MOOTW]). Appendix G provides a deep operations planning checklist. Appendix H covers environmental awareness and compliance. Appendix I discusses shipboard operations. Appendix J discusses FARP operations in detail and replaces FM 1-104. Appendix K discusses Army special operations aviation (ARSOA). Appendix L addresses mine warfare awareness.

The provisions of this publication are the subject of international agreements:

STANAG	QSTAG	AIR STD	TITLE
2002	501	84/10	Warning Signs for the Marking of Contaminated or Dangerous Land Areas, Complete Equipments Supplies and Stores (Edition 7)
2014	506		Operation Orders, Warning Orders, and Administrative/Logistics Orders (Edition 7)
2019	509		Military Symbols for Land Based Systems - APP-6 (Edition 3)
2047	183		Emergency Alarms of Hazard or Attack (NBC and Air Attack Only) (Edition 6)
2103	187		Reporting Nuclear Detonations, Biological and Chemical Attacks, and Predicting Warning of Associated Hazards and Hazard Areas - ATP-45 (Edition 7)
2104	189		Friendly Nuclear Strike Warning (Edition 7)
2404			Joint Anti-Armor Operations (DRAFT)
2868			Land Force Tactical Doctrine - ATP-35(B) (Edition 5)
2889	742		Marking of Hazardous Areas and Routes Through Them (Edition 3)
2999			Use of Helicopters in Land Operations - ATP-49(A) (Edition 2)
3497			Aeromedical Training of Aircrew and Aircrew NBC Equipment and Procedures (Edition 2)
3805		45/6B	Doctrine for Airspace Control in Times of Crisis and War - ATP-40 (A) (Edition 4)

277	Procedures for the Employment of Helicopters in Anti-Armor Role (Edition 3)
586	Procedures in the Event of a Downed Helicopter
768	Terrain Flight

This manual is intended for all Army aviation commanders and their staffs. In addition, any US military personnel expecting to conduct operations with Army aviation units should become familiar with this manual. Unless otherwise stated, when the masculine gender is used, both men and women are included. The manual has been reviewed for operational security (OPSEC) considerations.

The proponent for this publication is HQ TRADOC. Submit changes for improving this publication in DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, US Army Aviation Center, ATTN: ATZQ-TDS-DB, Fort Rucker, AL 36362-5000.

Doctrine Fundamentals, Missions, and Organizations

This chapter discusses the fundamentals and the tenets of Army aviation operations doctrine. It states the types of aviation brigade missions to be conducted within the framework of Army operations. It includes a list of the aviation brigade's capabilities and limitations. Finally, it provides the various aviation brigade organizational structures at echelons above corps (EAC), corps, and division levels.

SECTION I. Army Aviation Operations Doctrine

1–1. DOCTRINE FUNDAMENTALS

The aviation brigade is organized and equipped to support Army operations. It operates throughout the entire volume of a commander's battlespace. The aviation brigade is a fully integrated member of the combined arms team. It conducts combat, combat support (CS), and combat service support (CSS) operations to support the Joint Force commander. It operates across the entire length and breadth of the battlefield (close, deep, and rear); it can be expected to conduct simultaneous operations 24 hours a day.

1–2. TENETS OF ARMY AVIATION DOCTRINE

Army operations require worldwide strategic mobility. Given this requirement, Army forces must have the capability to conduct operations in any environment under any conditions. These conditions include war and other operations. Army aviation doctrine focuses on the integration and synchronization of aviation forces within the framework of the operational concepts of the land component commander. The ability to successfully fight and/or conduct other operations depends on the correct application of the five basic tenets of Army aviation doctrine. These tenets include—

    a. *Initiative.* Initiative allows the commander to set the terms of battle. It retains friendly force options while limiting the enemy's options. Retaining the initiative requires planning beyond the initial operation.

        (1) During the defense, operations are offensive in nature. Aviation's capabilities—such as speed, agility, and long–range direct fires—also allow the friendly force commander to set the terms of battle. Flexibility allows aviation commanders to attack from unexpected directions and locations.

        (2) In combat operations, aviation commanders set the tempo by seizing the initiative. Commanders fight tenaciously and aggressively. They never allow the enemy to recover from the initial shock of an attack. They push soldiers and systems to the limits of their endurance for as long as necessary.

        (3) In other operations, aviation commanders take the initiative by anticipating near– and long–term personnel, equipment, and logistical support requirements relative to the operation.

    b. *Agility.* Agility is the ability of friendly forces to act faster than the enemy. It is a prerequisite for seizing and holding the initiative.

        (1) In combat operations, aviation commanders exploit the agility of their units through speed, mobility, and reaction time capabilities. Technological developments in intelligence gathering, aviation mission planning, and communications have improved situational awareness during both the pre– and post–aircraft launch phases of an operation.

        (2) This situational awareness provides an edge to aviation commanders. Aviation assets can

now be directed to critical places at critical times on the battlefield. Furthermore, agility allows the aviation commander to rapidly rearm and refuel, get back into the fight, and continue to attack the enemy across the entire battlespace.

(3) In stability and support operations (SASO), aviation commanders use their assets to reach locations unreachable by other means of transportation. Aviation assets can move personnel, equipment, and supplies in large quantities and in a timely manner.

c. *Depth.* Depth is the extension of operations in time, space, resources, and purpose.

(1) In combat operations, aviation commanders understand depth—the ability to conduct simultaneous close, deep, and rear operations. They sustain the momentum by taking advantage of all available resources. They attack the enemy simultaneously in all battlefield dimensions. They have access to joint and combined arms capabilities. They can plan for, and control, numerous means of simultaneous or near–simultaneous ordnance delivery on multiple targets.

(2) In SASO, depth is the capability to conduct simultaneous, yet different type operations. For example, attack helicopters may be required to conduct reconnaissance throughout certain regions of an area of operations (AO). At the same time, medium–lift assets are transporting life support supplies in another part of the same AO; medical relief operations are being conducted in still another part of the same AO.

d. *Synchronization.* Synchronization is the application of military forces in time, space, and purpose to produce maximum relative combat power at the decisive time and place.

(1) In combat operations, aviation commanders understand synchronization—the planned integration and execution of combat power. Synchronization requires exact coordination among the various combat, CS, and CSS units in any operation as far as time. Joint and multinational asset capabilities must be considered where and when applicable.

(2) In SASO, aviation commanders must synchronize—both vertically and horizontally—planning phases, alert phases, deployment, early entry operations, mission execution, and redeployment.

e. *Versatility.* Versatility is the ability of units to meet diverse mission requirements. It is the essence of Army aviation.

(1) In combat operations, aviation commanders demonstrate versatility by their ability to shift focus, tailor aviation forces, and move from one role or mission to another rapidly and efficiently. Aviation forces must be prepared to deploy from one geographical region to another, and from one type of operation to another.

(2) In SASO, the aviation commander recognizes that mission requirements may not mirror the mission essential task list (METL) to which the aviation unit has trained. Non–METL based tasks require change in focus, rapid trainup, and execution under conditions outside the normal operating environment.

Section II. Aviation Brigade Missions

1–3. MISSIONS

Aviation brigades conduct combat, CS, and CSS missions. Each of these mission is conducted within the framework of Army operations.

a. *Combat Missions*. Aviation maneuver forces engage in destroying enemy forces by direct fire, indirect fire, and standoff precision weapons in joint and combined arms missions. These aviation

combat missions include—

- Reconnaissance.
- Security.
- Attack.
- Air assault.
- Special operations.
- Theater missile defense (TMD).
- Support by fire.

b. *Combat Support Missions.* Aviation CS missions, the operational support and sustainment provided to forces in combat by aviation units, include—

- Command, control, communications, and intelligence (C^3I).
- Air movement.
- Electronic warfare (EW).
- Aerial mine warfare.
- Combat search and rescue (CSAR).
- Air traffic services (ATS).

c. *Combat Service Support Missions.* Aviation CSS, the assistance provided by aviation forces to sustain combat forces, includes—

- Aerial sustainment.
- Casualty evacuation (CASEVAC).

1–4. CAPABILITIES

The aviation brigade conducts combat, CS, and CSS in combined arms, joint, and multinational environments. It significantly influences combat and noncombat missions by—

a. Conducting day, night, and limited visibility combat, CS, and CSS operations across the entire length and width of the battlefield.

b. Weighting the combat power of the theater, corps, division, or brigade/regiment commander by rapidly maneuvering forces to achieve mass at the critical time and place.

c. Shaping the battlespace by providing near real–time intelligence on the enemy's location, disposition, strengths, and intentions throughout the AO.

d. Influencing the tempo of friendly and enemy operations.

e. Conducting joint air attack team (JAAT) operations.

f. Conducting suppression of enemy air defense (SEAD).

g. Conducting air combat operations.

1–5. LIMITATIONS

Aviation brigades also are subject to some operating limitations to include—

a. Weather and obscuration effects on observation, acquisition, and engagement ranges of combat systems as well as the employment of all aviation forces.

b. Limited capability to secure unit assembly areas (AAs).

Section III. Organizational Structures

1–6. THEATER AVIATION BRIGADES

a. *Mission*

(1) Theater aviation brigades support EAC, corps, and division operations. Based on organizational structure, EAC brigades conduct combat, CS, and CSS according to theater operational requirements. Theater aviation brigades conduct joint, combined, and combined arms maneuver operations, and support theater special operations forces (SOF).

(2) Theater aviation units primarily support subordinate tactical units in the corps and divisions, although theater units may be required to conduct theater rear area security. These units may also serve as a tactical reserve.

b. *Structure*. A theater brigade is designed, tailored, and configured for the specific theater in which it operates. The Army component commander organizes theater brigades based on the mission guidance from the theater commander–in–chief (CINC). The brigade may be organized with any combination of attack, reconnaissance, assault, medium–lift, fixed–wing, and maintenance units; however, the normal structure would include a headquarters and headquarters company (HHC); one UH–60 Black Hawk–equipped command aviation battalion; one fixed–wing theater aviation battalion; one CH–47 Chinook–equipped theater helicopter battalion; and one ATS group. The theater Army area command (TAACOM) will provide an aviation unit maintenance (AVIM) company to the theater brigade. Figure 1–1 is an example of this structure.

```
24  UH-60
32  CH-47
16  C-12
16  C-23
```
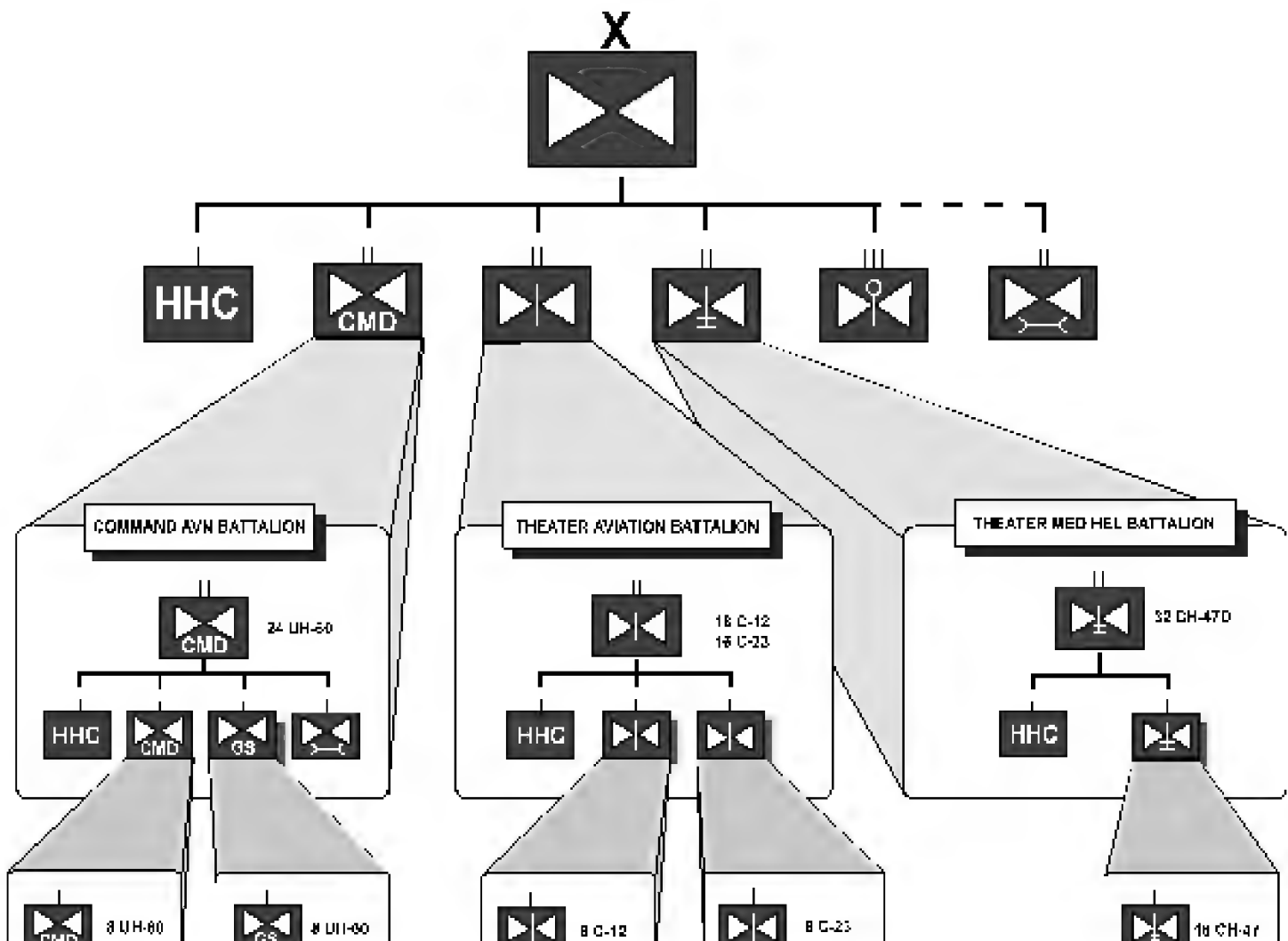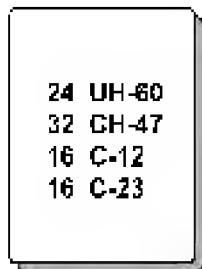
Figure 1–1. Theater aviation brigade

1–7. CORPS AVIATION BRIGADE

a. *Mission*

(1) The corps aviation brigade primarily conducts attack, reconnaissance, security, air assault, command and control (C^2), air movement operations, and ATS throughout the corps AO. The corps aviation brigade plans, coordinates, and executes aviation operations to support the corps scheme of maneuver; it can be expected to operate anywhere in the corps area. Attack helicopter units destroy enemy forces by fire and maneuver. Assault and CH–47 Chinook helicopter units transport combat personnel, supplies, and equipment for corps operations. Helicopters are provided to corps units requiring heliborne C^2 assets. ATS are provided for Army airspace command and control (A^2C^2) integration, airspace information, and terminal and forward area support services.

(2) Elements of the corps aviation brigade may operate directly for the corps commander or be placed under operational control (OPCON) of a subordinate division. The corps commander can task–organize other corps assets under the command of the corps aviation brigade or task the corps aviation brigade to support an armored cavalry regiment (ACR). In corps without ACRs, the aviation brigade may be tasked to be the covering force headquarters.

b. *Structure.*
Aviation brigades are organic to all US Army corps. Among the corps, there will be some differences concerning composite unit (COMPO) designations; however, the organizations basically are similar throughout the Army. The corps aviation brigade is composed of one HHC, one aviation group, and one attack regiment.

(1) The aviation group consists of an aviation group HHC; an assault helicopter battalion (AHB); a command aviation battalion (CAB); a combat support aviation battalion (CSAB); a CH–47 helicopter battalion; a light utility helicopter (LUH) battalion; and an assigned ATS battalion.

(2) The attack regiment consists of a regimental HHC and three AH–64 Apache attack helicopter battalions (ATKHBs). Corps attack regiments receive C^2 support from the corps CAB, while CS/CSS is provided from the corps CSAB.

(3) Corps support command (COSCOM) provides an AVIM battalion to support the corps aviation brigade.

c. *Utility Helicopter Support.*
The aviation brigade commander is key to the integration of the corps'

aviation resources. The CAB, CSAB, and LUH support the aviation brigade as well the corps with utility aircraft. The CSAB and LUH battalions also will provide CSS to the brigade's CH–47 battalion, AVUM units, and the attached AVIM units. Habitual relationships, standard procedures, and regular training will make this integration easier. The brigade staff will routinely plan/coordinate CAB and CSAB support for the attack battalions. Also the brigade commander will ensure programs are established that reenforce collective training proficiency; he will reinforce proficiency among the CAB/CSAB/LUH and the units they are required to support.

d. Figure 1–2 is an example of a corps aviation brigade.

```
15 OH-58C/
   OH-58D(I)
```

8 UH-60

16 CH-47D
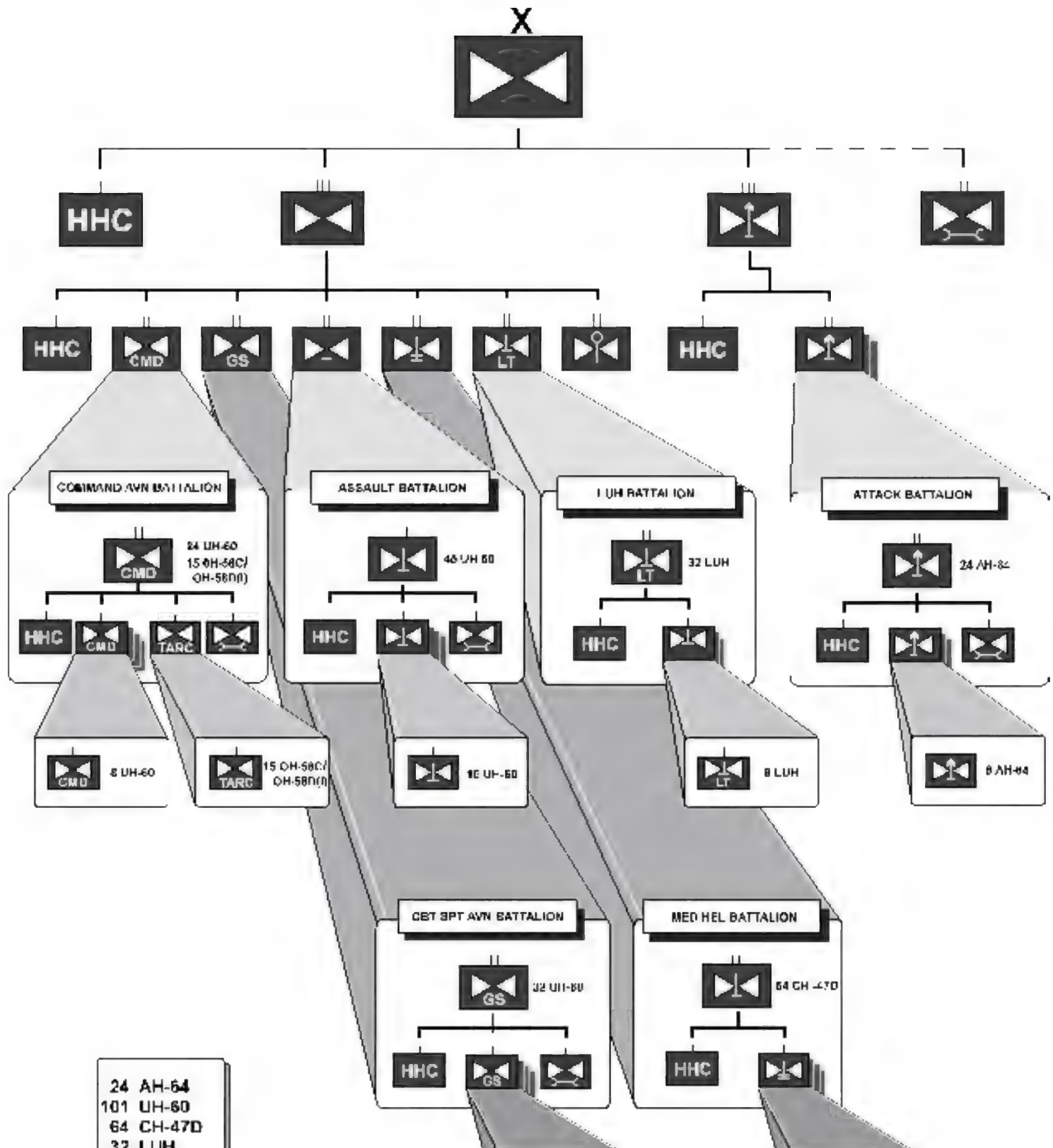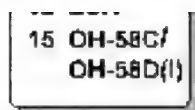
Figure 1–2. Corps aviation brigade

1–8. DIVISION AVIATION BRIGADES

a. *Mission.*

(1) The division aviation brigade conducts all aviation combat, CS, and CSS missions (except ATS and fixed–wing operations) to support the division scheme of maneuver. The primary missions of the division aviation brigade are to find, fix, and destroy enemy forces within the division area. The division aviation brigade can accomplish this mission as an aviation–pure or task–organized force.

(2) The division aviation brigade may be supported by higher echelon aviation assets. It must be prepared to support these assets throughout the duration of any given operation.

b. *Structures.* Aviation brigades are organic to all Army divisions. The designs of the aviation brigades have been tailored to meet the specific needs of the parent division, whether it be heavy, light, airborne, or air assault.

(1) *Heavy division aviation brigade*. The primary mission of the heavy division aviation brigade is to engage and destroy threat armored and mechanized forces. It is composed of a brigade HHC; one divisional cavalry squadron; one general support aviation battalion (GSAB); and two ATKHBs.

(a) The heavy division cavalry squadron consists of a headquarters and headquarters troop (HHT); an AVUM troop; three armored cavalry troops; and two air cavalry troops (ACTs). The two ACTs will be equipped with 8 OH–58D (I) aircraft. The ACTs will be aircraft pure.

(b) The heavy division GSAB consists of a battalion HHC; a command aviation company (CAC) with eight UH–60s; six OH–58Cs; and four EH–60s; two support aviation companies (SACs) with eight UH–60s each; and an AVUM company.

(c) The heavy division requires two ATKHBs. An attack battalion consists of an HHC; an AVUM company; and three attack helicopter companies (ATKHCs) equipped with eight AH–64 attack aircraft.

(d) Division support command (DISCOM) supports the division aviation brigade with an aviation support battalion (DASB) AVIM unit. The DASB has no organic aircraft.

(e) *Utility helicopter support*. The aviation brigade commander is the primary integrator of aviation assets within the division. The GSAB will provide support to the division, aviation brigade, cavalry squadron, the attack battalions, and the ASB. The aviation brigade will allocate resources based on METT–T, the scheme of maneuver, availability of assets, and the priorities set by the brigade commander. In addition, the brigade commander will ensure programs are established that reenforce collective training proficiency between the GSAB and the units they are required to support.

(f) Figure 1–3 is an example of a heavy division aviation brigade.
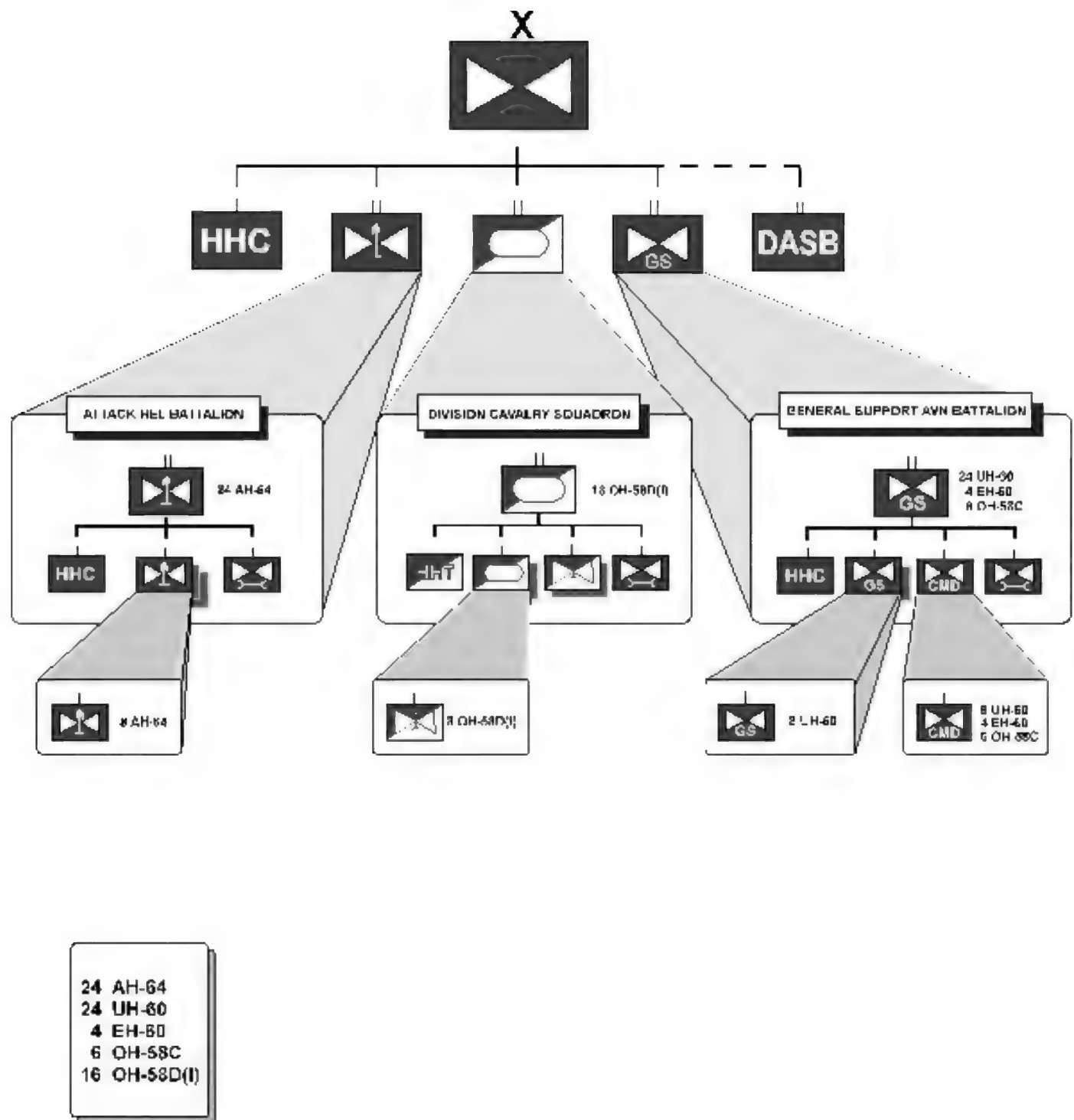
Figure 1–3. Heavy division aviation brigade

(2) *Light division aviation brigade.* The primary mission of the light division aviation brigade is to deploy worldwide—prepared to find, fix, and destroy enemy forces through fire and maneuver—and provide CS and CSS as an integrated member of a combined arms team. The light division aviation brigade is composed of a brigade HHC; one divisional cavalry squadron; one AHB; and one ATKHB.

(a) The light division cavalry squadron consists of an HHT; an AVUM troop; one ground cavalry troop; and two air cavalry troops (ACTs). The two ACTs will be equipped with eight OH–58D (I) aircraft. The ACTs will be aircraft pure.

(b) The light division AHB consists of an HHC; an AVUM company; a CAC with 8 UH–60s and 4 EH–60s; and three assault companies with 15 UH–60s each.

(c) The light division ATKHB consists of an HHC; an AVUM company; and three ATKHCs equipped with eight OH–58D (I) aircraft.

(d) DISCOM supports the division aviation brigade with an AVIM company. The AVIM company has no organic aircraft.

(e) *Utility helicopter support.* The aviation brigade commander is the primary integrator of aviation within the division. The assault battalion supports the aviation brigade as well as the division with utility aircraft. The attack battalion, cavalry squadron, and the attached AVIM company will be supported by the assault battalion for C^2, CS, CSS, and CSAR. The brigade commander will ensure programs are established that reinforce collective training proficiency between the AHB and the units they are required to support.

(f) Figure 1–4 is an example of a light division aviation brigade.
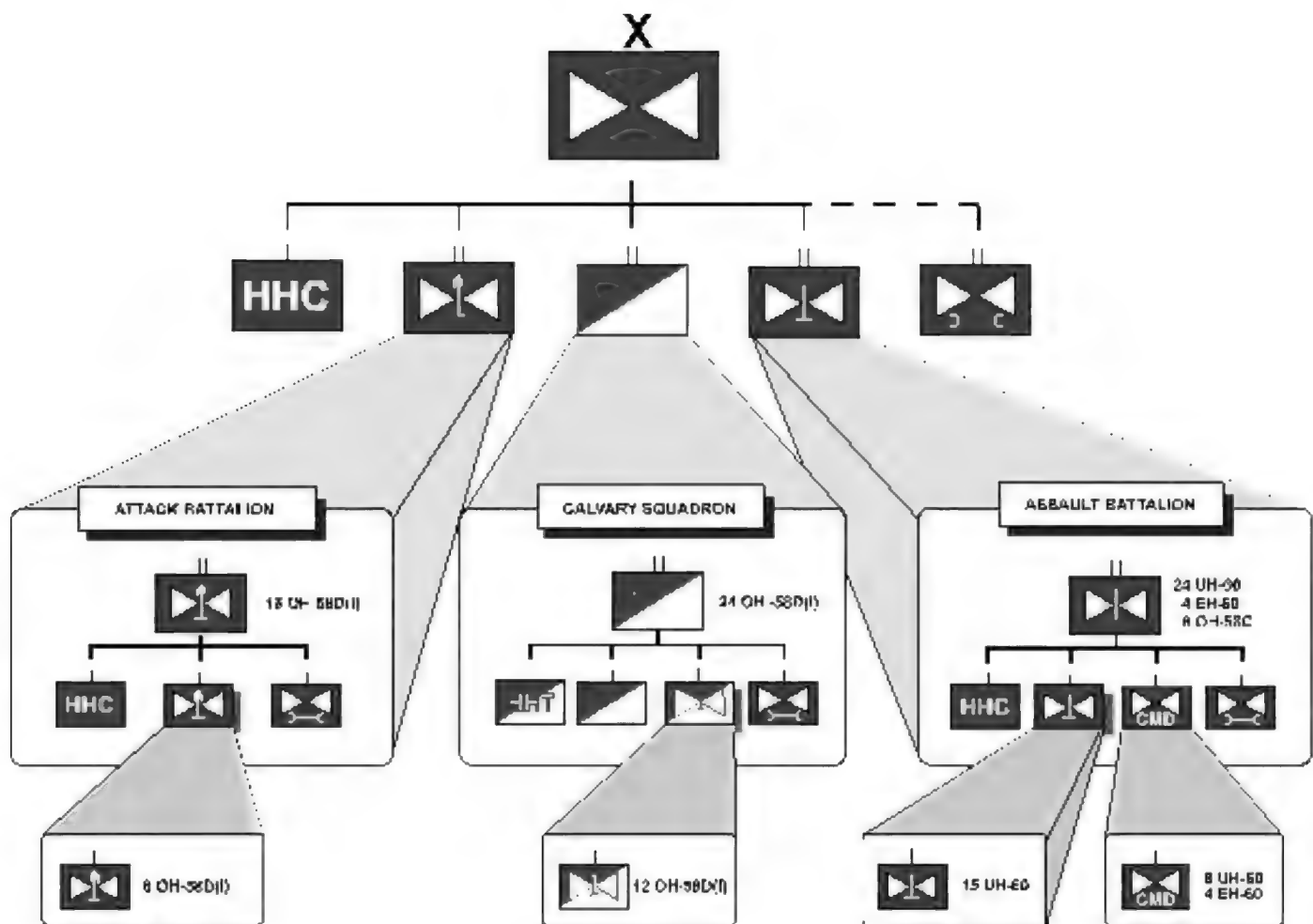
```
4 EH-60
```
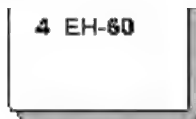
Figure 1–4. Light division aviation brigade

(3) ***Airborne division aviation brigade***. The primary mission of the airborne division aviation brigade is to deploy to any worldwide contingency to find, fix, report, and destroy enemy forces using aerial firepower and maneuver. The brigade also provides CS and CSS in coordinated operations as an integrated member of the combined arms team. These operations usually will include link up with follow–on forces at a later time. The airborne division aviation brigade is composed of a brigade HHC, one divisional cavalry squadron, one AHB, and one ATKHB.

> **(a)** The airborne division reconnaissance squadron consists of an HHT; an AVUM troop; one ground reconnaissance troop; and three ACTs. The three ACTs will be equipped with 8 OH–58D (I) each.

> **(b)** The airborne division AHB consists of an HHC; an AVUM company; a CAC with 8 UH–60s and 4 EH–60s; and three assault companies with 15 UH–60s each.

> **(c)** The airborne division ATKHB consists of an HHC; an AVUM company; and three ATKHCs equipped with three RAH–66 Scout aircraft and five RAH–66 attack aircraft each.

> **(d)** DISCOM supports the aviation brigade with an AVIM company. The AVIM company has no organic aircraft.

> **(e)** ***Utility helicopter support***. The aviation brigade commander is the primary integrator of aviation within the division. The assault battalion supports the division as well as the aviation brigade. Having no utility aircraft in the attack battalion requires the brigade to support the moving of Class I, III, and V and resources. The assault battalion for C^2, CS, CSS, and CSAR will support the ATKHB, cavalry squadron, and the attached AVIM company. In addition, the brigade commander will ensure programs are established that reinforce collective training proficiency between the AHB and the units it is required to support.

> **(f)** Figure 1–5 is an example of an airborne division aviation brigade.
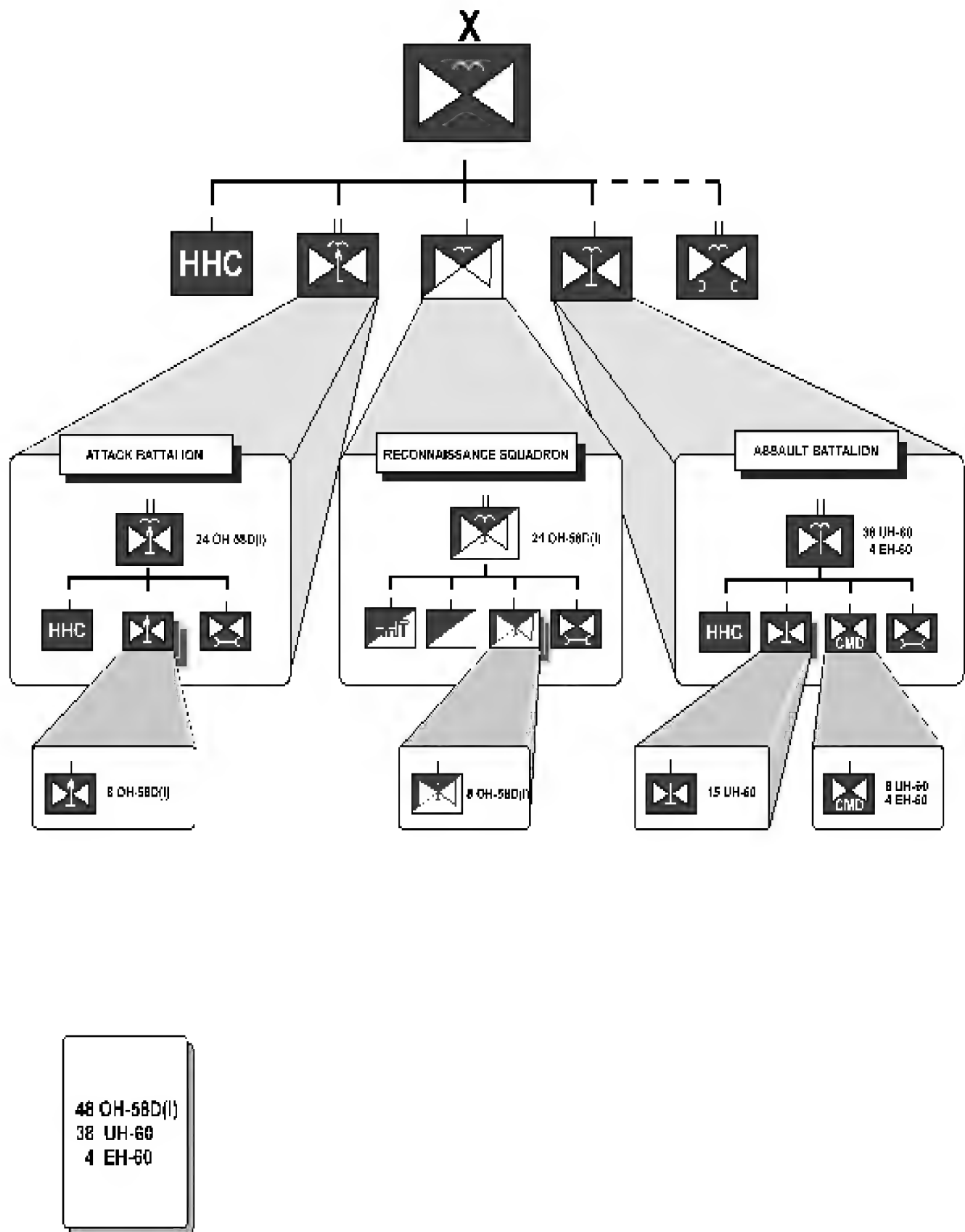
Figure 1–5. Airborne division aviation brigade

(4) *Air assault division aviation brigade.* The primary mission of the air assault division aviation brigade is to deploy worldwide on short notice; plan, coordinate, and execute aviation operations as an integrated element of an air assault combined arms team; and find, fix, and destroy enemy forces in joint, combined, or unilateral operations. The air assault division aviation brigade is

composed of a brigade HHC; one divisional cavalry squadron; one CH–47 helicopter battalion; three AHBs; one command aviation battalion (CAB); and three ATKHBs.

(a) The air assault division reconnaissance squadron consists of an HHT; an AVUM troop; and four ACTs. The four ACTs will be equipped with 8 OH–58D (I) each.

(b) The air assault division CH–47 helicopter battalion consists of an HHC and 3 CH–47 helicopter companies with 16 CH–47Ds in each company.

(c) The air assault division's three AHBs each consist of an HHC; an AVUM company; and three assault helicopter companies (AHCs) with 15 UH–60s in each company. The limited assets of the support aviation company in the CAB will require the assault companies to perform utility missions as well.

(d) The air assault division CAB consists of an HHC; an AVUM company; two CACs with eight UH–60s and four EH–60s each; and a support aviation company (SAC) with eight UH–60s.

(e) The air assault division's three ATKHBs each consist of an HHC; an AVUM company; and three ATKHCs equipped with eight AH–64 attack aircraft each.

(f) DISCOM supports the aviation brigade with an AVIM battalion. The AVIM battalion has no organic aircraft.

(g) *Utility helicopter support.* The aviation brigade commander is the primary integrator of aviation within the division. The CAB supports the division as well as the aviation brigade. Utility aircraft support the attack battalions, cavalry squadron, and the CH–47 battalion; the attached AVIM battalion will come from the CAB and the assault battalion. The brigade staff will routinely plan for utility support from the CAB and the assault battalion to the attack battalions, reconnaissance squadron, and CH–47 battalion. In addition, the brigade commander will ensure programs are established that reinforce collective training proficiency between the CAB and assault battalion and the units they are required to support.

(h) Figure 1–6 is an example of an air assault division aviation brigade.
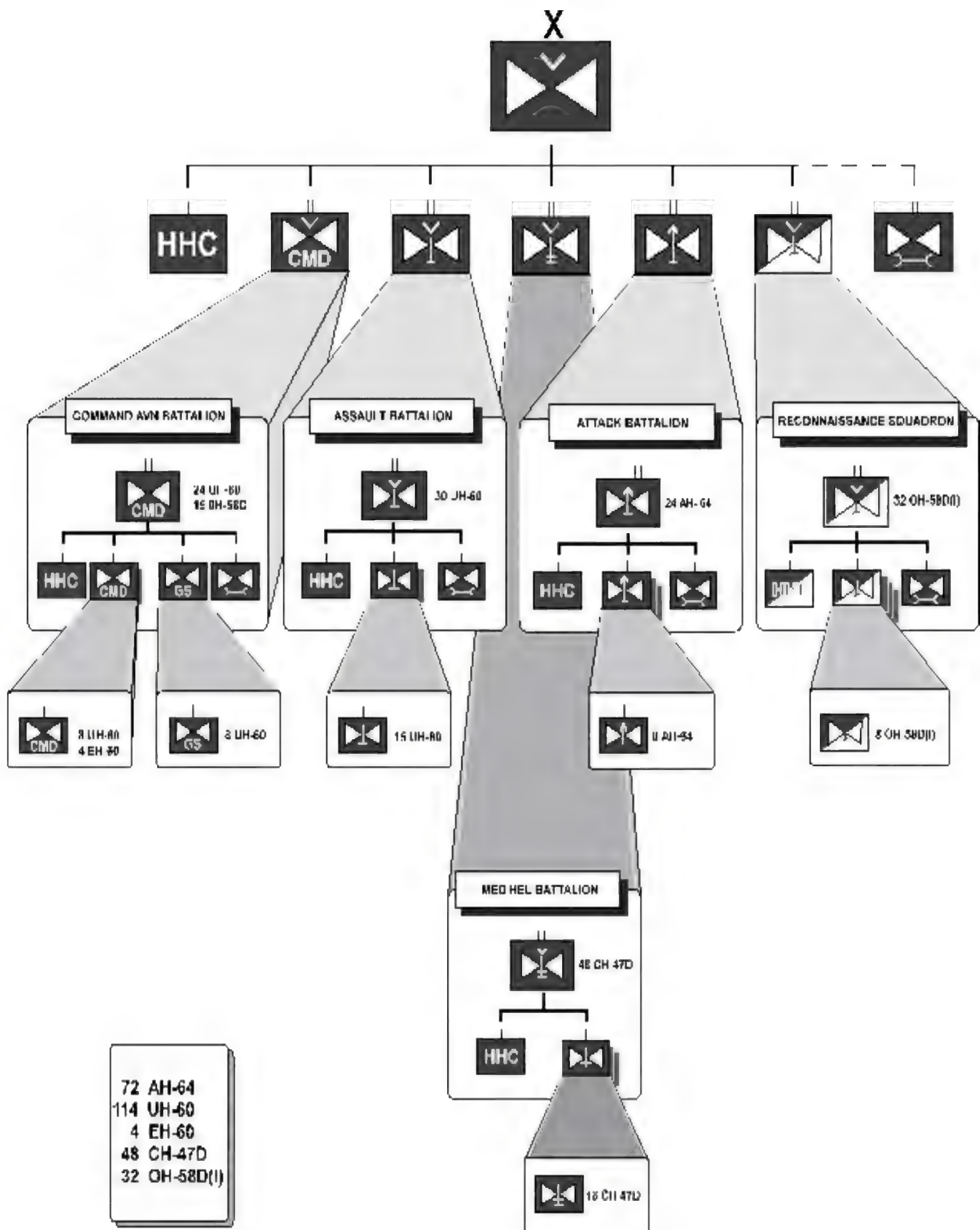
Figure 1–6. Air assault division aviation brigade

Chapter 2

Battle Command

This chapter addresses the battle command responsibilities of the commander and staff. It discusses control of these elements as they relate to battle management and command systems necessary for the commander to execute successful operations. Battle command is a vital factor in executing the tenets of Army aviation operations doctrine. It also is vital in surviving and winning quickly on future battlefields or in stability and support operations (SASO).

SECTION I. General Principles And Responsibilities

2–1. CONCEPT OF BATTLE COMMAND

a. Battle command is the art of battle decisionmaking, leading, and motivating soldiers—and their organizations—into action to accomplish missions. It includes visualizing the current and future states of friendly and enemy forces. Then it includes formulating concepts of operations to accomplish the mission. It includes assigning missions; prioritizing and allocating resources; assessing and taking risks; selecting the critical time and place to act; and knowing how and when to make critical adjustments during the fight. Commanders must see, hear, and understand the needs of seniors and subordinates, and guide their organizations toward the desired end.

b. The concept of battle command incorporates three vital components—***decisionmaking***, ***leadership***, and ***control.*** These components are discussed below.

(1) *Decisionmaking* is knowing *if* to decide, then *when* and *what* to decide. These are tactical, operational, and strategic judgments. To command is to anticipate the activities that will be put into motion once a decision is made. To command is to know how irretrievable some commitments will be once put into motion; to know the consequences of the act of deciding; and to anticipate the outcomes that can be expected from the implementation of a decision.

(2) *Leadership* is—

(a) Taking responsibility for decisions.

(b) Being loyal to subordinates.

(c) Inspiring and directing assigned forces and resources toward a purposeful end.

(d) Establishing a teamwork climate. The climate should engender success; demonstrate moral and physical courage in the face of adversity; and provide the vision that both focuses and anticipates the future course of events.

(3) *Control* is inherent in battle command. Control monitors the status of organizational effectiveness. It identifies deviations from set standards and corrects them. Control provides the means to regulate, synchronize, and monitor forces and functions. These tasks are performed through collection, fusion, assessment, and dissemination of information and data. Commanders control operations. Commanders lead from critical points on the battlefield, delegate authority, and synchronize aviation actions with other battlefield operations. Skilled staffs work within command intent to direct and control units. Skilled staffs resource allocations to support the desired end.

c. Reliable ***command communication systems*** are central to battle command. Effective battle

command requires reliable *signal support systems* that enable the commander to conduct operations at varying operational tempos. Signal planning increases the commander's options by providing the requisite signal support systems. These systems pass critical information at decisive times; thus, they leverage and exploit tactical success and make future operations easier. Battle command communication systems provide the electronic architecture upon which situational awareness is built.

2–2. ORGANIZATION AND FUNCTIONS

The commander uses the C^2 organization in structuring his staff to meet mission requirements. The organization defines the relationship and authority of each staff section; it establishes the functional grouping of the sections. Figure 2–1 shows a sample aviation brigade staff structure. The structure consists of personal, coordinating, and special staffs. The functions of these personnel are discussed below as they pertain to the aviation brigade staff.

a. *Aviation Brigade Commander.* The brigade commander is responsible for command, control, and coordination of the aviation brigade. He must know how to fight the brigade. He alone is responsible for the outcome of his force's combat actions on the battlefield. The variety and impact of tasks confronting him are unique. Although he commands a brigade–level organization, his focus of employment often is at division level and higher. These tasks require cooperation of many people, integration of complex systems, and sensible division of work. The brigade commander is responsible for the C^2 of organic, assigned, or attached aviation and nonaviation forces; these forces must be properly task–organized to accomplish all specified and implied tasks. He has to integrate the critical support provided by other friendly elements. His main concerns are to accomplish the mission and to ensure the welfare of his soldiers. The successful commander will delegate authority and foster an organizational climate of mutual trust, cooperation, and teamwork.

(1) The brigade commander is the force behind the tactical planning for the aviation brigade. He analyzes and defines the mission. He directs its execution. He issues mission–oriented orders. These orders are detailed only to the extent necessary for coordination within a broad scope. The commander acknowledges the professional competence and expertise of his subordinate commanders who have extensive latitude within his intent in how they execute their missions.

(2) All plans and orders are in concert with the senior commander's intent. Staffs and subordinate unit commanders must understand this intent. Thus, they can act appropriately when communications fail or local situations change. The brigade commander controls the ongoing battle. He provides guidance for planning future operations. He must position himself to best influence operations of subordinate units and maintain critical communications with higher, lower, and adjacent units. He normally is located in the main command post (CP) or—when the tactical CP is employed—with the tactical CP and essential staff elements.

(3) The aviation brigade's forces influence the spectrum of deep, close, and rear operations; therefore, the commander must see the battlefield from the same perspective as the higher commander. Tactical decisions constantly must be aimed at synchronizing his combat efforts with those of other force assets. The commander must know the enemy as well as he knows his own forces. His guidance should reflect the products of a detailed mission analysis supported by a thorough and current intelligence preparation of the battlefield (IPB).

(4) The brigade commander cannot win the battle alone but must rely on the brigade staff and subordinate commanders. They advise and assist in planning and supervising operations. The commander must understand his staff's capabilities and limitations. He must train them to execute operational concepts in his absence. He institutes cross–training among the staff; thus, the unit can still operate when combat losses occur. He also is responsible for safety and standardization during all conditions - peacetime or actual combat. He develops and directs a

brigade safety and standardization program. His safety officer, standardization officer, subordinate commanders, and staffs assist him.
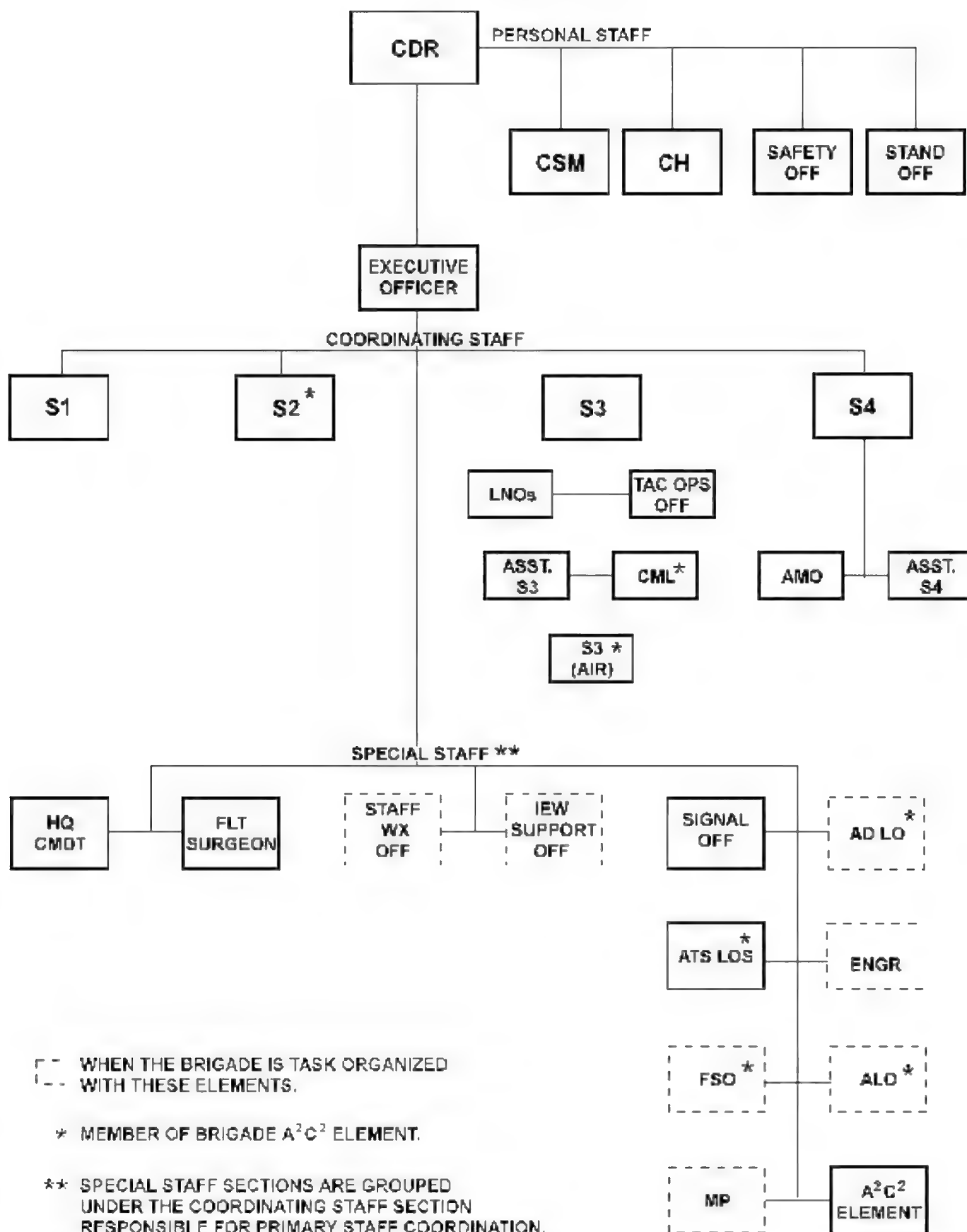
Figure 2–1. Typical aviation brigade staff structure

b. *Executive Officer.* The executive officer (XO) is the principal assistant to the commander and is second in command. The scope of the XO's duties are based on the desires of the commander. The commander must train the SO and allow him to assume command during training exercises so that he will be prepared to assume command in combat. He must be prepared to assume command in the absence of the commander at any time. In this capacity, the XO represents the commander and directs actions according to his policies.

(1) As staff coordinator and supervisor, the XO—

(a) Is responsible for the execution of staff tasks and the coordinated efforts of staff members.

(b) Ensures that the staff performs as a team; assigns definite responsibilities.

(c) Transmits the commander's decisions to the staff and to subordinate commanders, when applicable, in the name of the commander. Staff members can still deal directly with the commander. However, a staff officer is obligated to inform the XO of instructions or requirements received from the commander.

(d) Establishes liaison and liaison activities.

(e) Is responsible for the information program.

(f) Serves as the material readiness officer.

(2) During combat operations, the XO—

(a) Normally is positioned in the brigade main command post (CP).

(b) Coordinates combat support (CS) for the commander's plan; ensures that combat service support (CSS) is continuous; visits the brigade rear CP often to determine the status of CSS operations.

(c) Must remain current on the tactical situation and be prepared to assume command of close, deep, and/or rear operations on a moment's notice. His commander must train him and allow him to assume command during training exercises so that he will be prepared to assume command in combat.

(3) The XO—

(a) Formulates and announces staff operating policies.

(b) Ensures that the commander and staff are informed on matters affecting the command.

(c) Supervises the main CP and its operations.

c. *Brigade Staff.* The brigade staff consists of the officers and enlisted personnel who plan and supervise brigade tactical operations. The brigade staff synchronizes combat, CS and CSS operations. Thus, support is integrated according to the brigade commander's concept. Except in scope, the duties and responsibilities of the brigade staff are similar to those of higher echelon staff. Key personnel must be positioned on the battlefield where they can best carry out their duties.

(1) The SOP must clearly define the responsibilities of key personnel to preclude overlaps and ensure that all functions are supervised. SOPs streamline reports process by showing standard briefing formats and by identifying individuals in the chain who request, pass, and receive the information.

(2) The staff reduces the demands on the commander's time in various ways. It obtains and provides information, anticipates the situation, and makes recommendations. It also prepares plans and orders, supervises the execution of orders, and coordinates the operations.

(3) The staff members supply the aviation brigade commander with an accurate picture of the area of operations (AO). Delays in receiving or disseminating critical information affect the entire operation. The staff must identify key indicators and "*push*" for quick and accurate reports from both subordinate and higher headquarters. The staff must restrict requests for information to those people or agencies needed to accomplish the mission. Information flow—both horizontally and vertically—needs to be on a priority basis. Operational conditions dictate these priorities.

(4) The staff estimate may be informal at this level; however, it must address battlefield activity, project courses of action, and predict results. Careful IPB, selection of the most important enemy indicators, and development of contingency plans facilitate the estimates and allow for timely response. The key person in this process is the XO; he ensures that the staff maintains a forward–looking perspective.

(5) The aviation brigade must deal successfully with the C^3 challenge. To do so, the commander must not be burdened with detailed, structured staff briefings. The XO must control the staff. He must ensure that discussions with the commander are open and frank, and that they follow a prioritized agenda list.

d. *Personal Staff.* Personal staff officers work under the immediate control of the commander. They assist him directly instead of working through the XO. They may perform some of their duties as personal staff officers; the remainder of their duties they may perform as special staff officers or members of a coordinating staff section. Members of the personal staff include those personnel authorized by the table(s) of organization and equipment (TOE) and table of distribution and allowances (TDA) as personal assistants to the commander; personnel the commander desires to supervise directly; and those personnel who, by regulation, have a special relationship to the commander.

(1) *Command sergeant major (CSM).* The brigade CSM is the senior noncommissioned officer (NCO) in the brigade. He acts in the name of the commander when dealing with other NCOs in the unit; he advises the commander concerning the enlisted ranks. Though not an administrator, he must understand the administrative, logistical, and operational functions of the unit to which he is assigned. Since he normally is the most experienced soldier in the unit, his attention should be focused on operations and training and on how well the commander's decisions and policies are being carried out. He is the senior enlisted trainer in the organization. He works closely with battalion commanders when coaching and training battalion CSMs and first sergeants. He maintains close contact with subordinate and attached unit NCOs. The CSM must be tactically and technically proficient in combat operations at brigade, battalion, and company levels. The CSM should act as the commander's representative in supervising aspects vital to an operation as determined by the commander and by himself. For example, he can lead the quartering party during a major movement or he can perform tasks such as monitoring casualty evacuation (CASEVAC). The CSM can also help in the CSS efforts during battle or move around the brigade AOs, as necessary, to monitor the performance and progress of the brigade personnel. Army Regulation (AR) 600–20, Training Circular (TC) 22–6, and Field Manual (FM) 101–5 describe more of the specific duties of the CSM.

(2) *Chaplain.* The brigade chaplain executes the religious support plan for the command. The brigade chaplain performs the following functions—

(a) Plans, recommends, and implements the commander's religious support plan.

(b) Facilitates soldiers' free exercise of their religious rights, beliefs, and practices.

(c) Performs appropriate religious services, rites, ordinances, sacraments, and ministrations.

(d) Performs and provides for first–level combat casualty ministry.

(e) Establishes coordination with civilian religious leaders and chaplains of other services as required or directed by the commander or appropriate staff officer.

(f) Monitors casualty data to ensure adequate religious support to critical areas on the battlefield and to coordinate unit ministry team (UMT) replacements as required.

(3) *Safety officer.* The safety officer advises the brigade commander on both aviation and ground safety matters. The safety officer—

(a) Develops and implements the brigade aviation and ground safety programs.

(b) Continuously monitors all brigade operations and evaluate them as they affect the overall safety program.

(c) Advises planners of critical safety issues associated with planned missions.

(d) Monitors and advises subordinate unit safety officers as required.

(4) *Standardization officer.* The standardization officer is the key advisor to the commander on matters pertaining to aircraft standardization, use, and training. The standardization officer—

(a) Develops, integrates, implements, monitors, and manages the aircrew training and standardization programs.

(b) Conducts the standardization and training interface between subordinate units and division, corps, installation, major Army command (MACOM), and Department of the Army (DA).

e. *Coordinating Staff.* Coordinating staff officers are the commander's principal staff assistants. They are directly responsible to the XO; however, the commander often consults them directly. These staff officers inform the XO of such exchanges with the commander. Each is concerned with one or a combination of the broad fields of interest. They assist the commander by coordinating the plans, activities, and operations of the command.

(1) Coordinating staff officers collectively assist the commander in executing his responsibilities; exceptions are those functional areas that the commander controls personally or that are reserved by regulation for specific staff officers. Each coordinating staff officer ensures that activities of special staff officers falling within his field of interest and responsibility are coordinated and integrated with operations.

(2) Coordinating staff officers often have a direct interest in areas that are the responsibility of another staff officer. For example, training is a primary staff responsibility of the operations officer; however, the intelligence officer and the logistics officer are directly concerned with training within their respective fields of interest. In such instances, staff responsibilities must be clearly defined to ensure coordination and to eliminate conflict. The XO, following the commander's guidance, assigns definite responsibilities to each staff officer concerned; he assigns primary responsibility to a single coordinating staff officer.

(a) *Personnel officer (S1).* The S1 normally operates from the brigade rear CP and is collocated with the S4. The S1 is responsible to the brigade commander for unit strength,

personnel management, morale, discipline, and law and order. The S1 and S4 must cross–train so that they can conduct continuous operations. The S1 performs personnel functions outlined in FM 101–5 and TC 12–17. Although the S1 and S4 are normally located in the brigade rear CP, they continuously maintain liaison with the tactical operations center (TOC). If assets are available, an S1 representative and an S4 representative are collocated at the main CP to effect continuous liaison and coordination for current and future operations. This collocation will ease coordination of personnel and logistics requirements or effects of personnel and logistics on operational requirements. Normally, the senior in rank of the S1 and S4 officers is responsible for the brigade rear CP and the disposition, status, and operations of all aviation brigade units in the rear area.

(b) *Intelligence officer (S2).* The S2 monitors and contributes to the overall reconnaissance and surveillance effort. He also supervises the activities of attached intelligence assets. The S2 is responsible for the functions described in FM 34–1, FM 34–3, FM 34–60, FM 34–80, FM 34–130, and FM 101–5. An aviation brigade S2 may have to prepare, continuously update, and disseminate a "*hazards to flight*" map and provide in–flight intelligence. The S2 normally remains at the TOC where communications assets are available to—

- Coordinate surveillance and reconnaissance activities.
- Update the intelligence estimate.
- Maintain the enemy situation map.
- Provide current weather data.
- Evaluate and interpret enemy information.

(c) *Operations officer (S3).* The S3 is the commander's principal assistant for planning and coordinating brigade operations. The S3 monitors the battle, coordinates to ensure that essential CS and CSS assets are provided when and where required, and anticipates developing situations. The assistant S3, the tactical operations (TACOPS) officer, the S3 (Air), and chemical and signal officers normally work directly for the S3. The S3, assistant S3, TACOPS officer, and S3 (Air) must always be abreast of the situation. They must be responsive to directives from higher headquarters; they must also be aware of the needs of subordinate commanders and supporting organizations. The S3 normally is in the command group. He often positions himself in the TOC unless the tactical CP is employed. If aviation brigade activities are oriented in several directions, the S3 may be best suited at the TOC or he may assume individual control of part of the battlefield as directed by the commander. The S3 must coordinate continuously with other staff elements. FM 101–5 covers the responsibilities of the S3 in more detail. However, an aviation brigade S3 has unique responsibilities to—

- Routinely plan and coordinate combined arms, joint, and combined operations across the depth and width of the battlefield simultaneously.
- Direct A^2C^2 functions for the aviation brigade.
- Develop and coordinate the brigade's aircrew training program in lieu of an aviation brigade standardization officer.
- Monitor and advise subordinate unit standardization officers so that they maintain a high level of readiness in aviation training.
- Advise the brigade commander on the training posture of the brigade's aviation training program and on standardization.
- Develop brigade collective training plans and ensure habitual training relationships are fostered between subordinate units.

(d) *Assistant S3.* The assistant S3 normally is responsible for operations in the absence of the S3. He performs those tasks identified under the responsibilities of the S3.

(e) *Tactical operations (TACOPS) officer.* The TACOPS officer coordinates, prioritizes, plans, schedules, assigns, briefs, and monitors *approved* aircraft missions to subordinate units. He—

- Develops, implements, and manages the flying hour program.
- Supervises data entry into the Aviation Mission Planning System (AMPS) for dissemination down to subordinate units.
- Oversees functions of subordinate units' aviation life support equipment (ALSE), aviation survivability equipment (ASE), electronic warfare (EW), and flight records programs.
- Recommends battalion battle positions and ingress/egress routes as the EW officer.
- Advises the commander on aircraft mission planning, taskings, status of aircraft, ALSE, ASE, EW, and flight records.
- Conducts interface and continuity between subordinate units and higher head quarters for all aspects of aircraft mission coordination and taskings.
- Monitors current aviation tactical operations.

(f) *S3 (Air).* The S3 (Air) is the principal advisor in coordinating joint air support operations for the aviation brigade. He may also serve as the S3 (Plans) officer. Working directly for the S3, the S3 (Air)—

- Advises the commander on tactical deployment and employment of aircraft.
- Assists the S3 in preparing aviation portions of estimates, plans, orders, and reports.
- Forwards preplanned requests for tactical air support—such as close air support (CAS) and joint air attack team (JAAT) missions—to higher headquarters and immediate requests to the tactical air control party (TACP), tactical air coordinator (airborne) TAC(A), or corps air liaison officer (ALO).
- Assists the TACP (if available to the brigade) regarding orientation, security, and logistics.
- Supervise the brigade A^2C^2 element.

(g) *Chemical officer (CHEMO).* The CHEMO normally works under the direct supervision of the S3. The chemical officer—

- Advises the commander on defensive nuclear, biological, chemical (NBC) operations.
- Coordinates with the S2 on developing the NBC IPB.
- Prepares NBC estimates, plans, and SOPs.
- Receives, collates, evaluates, prepares, and distributes NBC reports.
- Recommends mission–oriented protected posture (MOPP) levels based on MOPP analysis.
- Plans and coordinates NBC reconnaissance operations.
- Plans, coordinates, and monitors air and ground decontamination operations and chemical monitoring and radiological surveys.
- Maintains the radiation exposure status of subordinate and attached units and ensures statuses are passed to the S1 and flight surgeon.
- Advises the commander regarding smoke and flame operations.

- Conducts a nuclear and chemical vulnerability analysis.
- Coordinates with the S4 and flight surgeon on logistics requirements for NBC equipment.
- Exercises staff supervision over NBC training throughout the command.
- Participates as a member of the brigade's Army airspace command and control (A^2C^2) element.

(h) *Liaison officers (LNOs).* Most aviation brigades will be assigned three LNOs each with his own vehicle and driver. Their role is critical to the success of the brigade's mission. These officers represent the aviation brigade at higher, adjacent, or supported units based on the needs of the commander. They engage in direct mission planning, coordination, and execution and serve as the subject matter experts (SMEs) on the aviation brigade's capabilities, limitations, and employment.

(i) *Logistics officer (S4).* The S4 must understand the commander's intent and initiate timely actions to support that intent. The S4 usually collocates with the S1 in the brigade rear CP. The S4 monitors the tactical situation closely to begin resupply quickly. He designates two or three people from the section to help him operate the administrative and logistics center. He also provides the commander with information on all logistical matters. The S4 coordinates with subordinate S4s on the status of equipment and supplies and the ability of brigade rear operations to support their needs. He also coordinates the brigade rear elements, supports their missions, and directs their disposition on the battlefield. The S4, with the S1, operates the administrative and logistics communication net. The S4 will perform those logistics functions described in FM 101–5. In lieu of an aviation brigade maintenance officer, the S4 advises the brigade commander regarding aviation and ground maintenance and aircraft availability. The S4—

- Continuously monitors each subordinate unit's maintenance program and aircraft availability.
- Assists units with coordination of external support.
- Advises the commander on the maintenance posture of subordinate units.
- Establishes priorities for aviation and ground maintenance.

(j) *Assistant S4.* In the absence of the S4, the assistant S4 assumes the responsibility for brigade logistics; he performs those duties as directed by the S4. The duties may include sustainment and logistics operations or specific logistics functions such as Class III and V or maintenance.

(k) *Aviation materiel officer (AMO).* The AMO is the technical advisor to the commander for aircraft readiness, logistical support, maintenance policy and procedures, and force modernization. The AMO—

- Develops, integrates, implements, and monitors aviation maintenance operations and procedures.
- Conducts maintenance interface between subordinate units and division, corps, installation, MACOM, and DA.

f. *Special Staff.* Special staff officers assist the commander in professional, technical, and other functional areas. At brigade level, special staff officers are found either organic to the headquarters and headquarters (HHC) or attached to those units that support the brigade. Special staff officers who normally advise the brigade commander during combat operations are listed below along with a discussion of their functions.

(1) *Army airspace command and control (A^{2}C^2) personnel.* The brigade's A^{2}C^2 element focuses on airspace management and deconfliction. The brigade's A^{2}C^2 element is formed with the S3 (Air), air liaison officer (ALO), fire support officer (FSO), air defense (AD) liaison officer (LNO), air traffic services (ATS) LNOs, and CHEMO. FM 100–103 further addresses A^{2}C^2. The A^{2}C^2 cell—

    (a) Identifies and resolves airspace conflicts.

    (b) Develops and maintains airspace use and situation overlays or automated displays.

    (c) Requests, maintains, and disseminates A^{2}C^2 measures or restrictions.

    (d) Develops and coordinates the A^{2}C^2 annex to tactical operations plans.

(2) *Signal officer.*

    (a) The brigade signal officer (BSO) is responsible to the brigade commander for the tactical application of the information mission area (IMA). The BSO's duties involve general and special staff functions. The BSO works under the direct supervision of the brigade XO on overall automation and communications issues that affect the command. The BSO coordinates all communications and automation with the brigade staff. The functions of the BSO are advisory, coordination, plans and orders, supervisory, liaison, and training.

    (b) The BSO advises the brigade commander, staff, and all brigade units on tactical information management. This includes employment of signal troops, availability of communications facilities and their required augmentation, communications security (COMSEC), and how location of brigade CPs affects communications. This information may first pass through the S3 according to brigade SOP.

    (c) The BSO is included in all staff coordinations/planning to present the communications aspects of tactical operations and automation resources.

(3) *Headquarters (HQ) commandant.* The HQ commandant is commander of the brigade HHC. He answers directly to the brigade XO. He is responsible for the training of assigned personnel; the maintenance of organic equipment; and the support, security, and movement of the brigade TOC and tactical CP and supporting elements according to the unit SOP.

(4) *Fire support coordinator (FSCOORD).* When fire support assets are provided, the commander of the direct support unit usually serves as the brigade FSCOORD. He is the brigade commander's primary fire support (FS) advisor. Because of his duties, this artillery commander cannot always be at the brigade headquarters. Therefore, he provides a full–time fire FS element. The fire support element (FSE) usually consists of a fire support officer (FSO), an FS sergeant, and two FS specialists. The FSO—

    (a) Keeps higher and subordinate FSEs informed of the supported force's situation.

    (b) Exchanges battlefield information—to include the positioning of FA with the supported force.

    (c) Establishes, operates, and displaces the FSE.

    (d) Recommends coordinating measures for force FS.

    (e) Supervises the target acquisition effort of the FSE.

(f) Prepares and disseminates FS documents, records, and reports.

(g) Advises the supported commander and other FS representatives on enemy and friendly FS.

(h) Integrates FS in battle plans.

(i) Coordinates survey operations for maneuver forces so that a common grid location is rapidly established.

(j) Prepares and executes the force's FS plan.

(k) Monitors and initiates requests for FS and analyze targets for attack by FS.

(l) Makes recommendations concerning FS.

(m) Participates as a member of the A^2C^2 element.

(n) Supervises, trains, and evaluates his FSE and subordinate FSEs, as appropriate.

(o) Analyzes targets to determine which munitions to use.

(p) Ensures that communications for the FSE are adequate.

(5) *Brigade engineer.* When engineers are placed in direct support (DS) of the aviation brigade, the brigade receives an engineer liaison element. Normally, this element consists of a brigade engineer officer, an operations NCO, a combat construction foreman, and a vehicle driver. The brigade engineer—

(a) Prepares the obstacle and barrier plan.

(b) Provides engineer expertise for planning.

(c) Develops an estimate of critical engineer work load.

(d) Requests augmentation assets from the corps engineer.

(e) Coordinates engineer support for maneuver task forces (TFs).

(f) Serves as the engineer TF commander when two or more engineer companies operate in the brigade section.

(6) *Staff weather officer (SWO).* The theater, corps, or division SWO provides a DS team to the aviation brigade. The weather team consists of an Air Force SWO, weather forecasters, and observers. This team furnishes direct weather forecasts to the brigade. The team supports the brigade S2 for the IPB; it conducts weather briefings for aircrew mission planning.

(7) *Flight surgeon.* The flight surgeon advises and assists the commander so that he can conserve the fighting strength of the command to include preventive, curative, and restorative care and related services. The surgeon is normally located at the brigade clearing station within the brigade support area. He also—

(a) Recommends the medical status of aircrew members.

(b) Advises the commander on health services of the command and the occupied or friendly territory within the commander's areas of responsibility and interest.

(c) Advises the commander on the medical effects of the occupational and natural environments, and of NBC weapons on personnel, rations, and water.

(d) Determines requirements for the requisition, procurement, storage, maintenance, distribution, management, and documentation of medical, dental, optical, and veterinary equipment and supplies.

(e) Plans, coordinates, and integrates medical training in the command.

(f) Supervises activities of subordinate battalion surgeons, if assigned.

(g) Establishes/updates the medical sections of the command field SOP.

(h) Establishes/updates the medical portions of the Army airfield emergency preparedness plan.

(i) Performs other duties of a special staff officer as assigned by the brigade commander.

(8) *Air liaison officer (ALO).* The ALO is an Air Force officer who is a member of the TACP. The TACP usually consists of two ALOs—one major and one captain—and three enlisted terminal attack controllers (ETACs)—one technical sergeant and two sergeants. They operate from vehicles equipped with organic frequency modulation (FM), high frequency (HF), ultra high frequency (UHF), and very high frequency (VHF) radio systems. In the absence of an assigned TACP, the S3 (Air) performs the duties of the ALO. The ALO—

(a) Advises the commander and staff on the employment of air support including CAS, air interdiction, suppression of enemy air defenses (SEAD), reconnaissance, airlift, and battle damage assessment (BDA).

(b) Operates on the US Air Force (USAF) air request net.

(c) Transmits immediate requests for CAS and reconnaissance support from the brigade headquarters.

(d) Coordinates air support requests and missions with staff elements.

(e) Supervises the TACP.

(f) Participates as a member of the A^2C^2 element.

(9) *Military police (MP) platoon leader.* The MP platoon leader acts as staff adviser on MP maneuver, CS, and CSS operations when the aviation brigade receives MP support. He directs the actions of the MP platoon in support of the brigade. The platoon leader normally will be located at the main CP to help the S3 integrate MP support into future operations planning. The MP platoon leader—

(a) Supervises battlefield circulation control operations: route reconnaissance and surveillance; main supply route (MSR) regulation enforcement; refugee and straggler control; and police intelligence, tactical and criminal, collecting, and reporting.

(b) Plans area security operations that will protect personnel, material, and facilities from enemy rear attacks.

(c) Monitors enemy prisoner of war (EPW) operations to ensure the humane treatment, accountability, evacuation, and internment of EPWs and civilian internees.

(d) Supervises law–and–order operations.

(e) Prepares the MP portion of estimates, plans, orders, and reports.

(10) *Air defense (AD) coordination officer.* The AD coordination officer is the single point of

contact (POC) for AD for the brigade commander. The air defense artillery (ADA) element normally remains at the TOC to coordinate between the aviation brigade and AD units. In addition to the AD coordination officer, the ADA element consists of an assistant ADA/airspace officer and an NCO section chief. The ADA element—

(a) Coordinates vertically and horizontally with AD units for integration of coverage.

(b) Provides expertise on AD employment and tactics.

(c) Advises on active and passive AD measures.

(d) Gives guidance on using non–AD weapons for AD.

(e) Prepares the AD portion of estimates, plans, orders, and reports.

(f) Provides information regarding AD unit dispositions and missions, the weapons control status, and early warning of threat air attack.

(g) Functions as part of the A^2C^2 element.

(11) *Intelligence and electronic warfare (IEW) support officer.* The IEW support officer is the chief of the intelligence and IEW support element provided to the brigade from the military intelligence (MI) battalion. The IEW support element performs liaison between the brigade and the MI battalion. The IEW support officer—

(a) Advises the brigade S2 and S3 on the capabilities, limitations, and employment of MI assets.

(b) Assists the brigade S2 in planning the use of MI assets and in preparing mission requirements.

(c) Coordinates with the supporting MI elements or the IEW company team commander to ensure rapid responses to requirements.

(d) Ensures rapid dissemination of combat information from MI elements directly to the brigade S2.

(e) Ensures that deployed DS MI elements are advised of friendly force maneuvers that directly affect their security.

(12) *Air traffic services (ATS) representative.* Normally, the ATS LNOs are provided from the ATS battalion. The ATS LNO performs liaison between the brigade and the ATS battalion. The ATS LNO—

(a) Serves as the integrator within the A^2C^2 element.

(b) Advises the brigade S3 of available ATS assets.

(c) Advises the brigade S3 on the limitations, capabilities, and optimum employment of ATS facilities.

(d) Coordinates with other members of the A^2C^2 element, brigade staff, and adjacent ATS facilities.

SECTION II. Facilities and Operations

2–3. COMMAND AND CONTROL FACILITIES

a. The aviation brigade commander organizes his staff sections so that they can acquire and analyze critical information, and determine and direct actions required for C^2. He also organizes his C^2 facilities to enhance C^2.

    (1) The primary C^2 facilities are the command posts—main, tactical, and rear. Command posts throughout the brigade serve the C^2 needs of the commander and staff in deep, close, and rear operations.

    (2) The dynamics of the battlefield require the highest level of organizational and operational efficiency within CPs at all echelons. Automated and manual information systems minimize the time required for administrative and operational processing of information. They accurately depict the tactical situation; preclude data from having to be verified; and make information immediately available to the commander and staff members.

    (3) As more digitized C^2 systems are fielded throughout the Army, our C^2 nets and procedures will change drastically to support the commander. The proliferation of modern systems that allow him to maintain constant situational awareness and communicate with all his forces when on the move will reduce the commander's reliance on multiple CPs to conduct operations. Other C^2 facilities may include forward arming and refueling points (FARPs), AAs, and support areas.

b. CPs and their supporting automation and communication systems are high–priority targets. They present radio–frequency, thermal, acoustic, visual, and moving–target signatures that are fairly easy to detect. They will be disrupted or exploited by electronic means, if not destroyed, unless measures are taken to make then less vulnerable. These measures should include—

    (1) Maintaining local security.

    (2) Locating them on reverse slopes to deny enemy direct and indirect fire effects.

    (3) Locating them in urban areas to harden and reduce infrared or visual signatures.

    (4) Remotely locating and dispersing antennas.

    (5) Dispersing CP subelements.

    (6) Displacing them often.

    (7) Using low probability of interception (LPI) techniques, such as frequency hopping radios and landlines, when applicable.

    (8) Communications security.

c. In most cases, survivability requires that techniques be combined. These measures must also be balanced against retaining effectiveness. Frequent displacement might reduce the vulnerability of a CP; however, such movement may then greatly degrade its C^2 functions.

d. The brigade commander organizes his headquarters and staff to control, sustain, and support his forces. Normally, the aviation brigade will have a main CP (para 2–4 below) and a rear CP. A tactical CP (para 2–5 below) will be established, when required, to control a key operation. A UH–60 Black Hawk, equipped with a C^2 system, can meet the TAC requirement when increased mobility is required. The brigade main CP will be positioned to command, control, and communicate with its forces. The aviation brigade commander may position his C^2 facilities like those in Figure 2–2. The

network will be modified to meet the situation. Brigade units under the control of other headquarters will position their elements to provide C^2 and to allow sustainment and communications. Figures 2–3 and 2–4 reflect typical dispositions of a corps aviation brigade and an echelon above Corps (EAC) aviation brigade.

2–4. MAIN COMMAND POST

a. The main CP coordinates, directs, and controls current operations and tactical planning for future operations. It collects and disseminates reports and produces plans and orders and intelligence products. The main CP consists of the TOC, logistics support elements, maintenance facilities, and associated CS assets such as communications facilities. An example of a main CP configuration is at Figure 2–5.

b. Most of the brigade staff operate from the main CP. The staff includes the S2, S3, FSO, and ALO or their representatives; TACP, if attached; and personnel of the signal platoon. Other representatives can be included such as engineer, AD, or intelligence personnel and the USAF weather team.

c. Personnel in the main CP operate from the TOC and monitor operations on a 24–hour basis. They maintain communications with their subordinate, higher, and adjacent units. They also maintain maps and records and receive and disseminate reports as required. TOC personnel are continuously planning ahead and providing information and assistance to the commander and his subordinate commanders. They must be responsive to requests and have a sense of urgency at all times.

d. The TOC must be prepared to assume total control of the current operation during the displacement of the tactical CP. Among other functions, TOC personnel—

(1) Maintain situational awareness.

(2) Validate and evaluate intelligence of interest to the commander.

(3) Control combat, CS, and CSS forces.

(4) Control all immediate fire support to include tactical air support for units under aviation brigade C^2.

(5) Coordinate airspace C^2 and AD operations.

(6) Receive, evaluate, and process tactical information from subordinate units and higher headquarters.

(7) Relay instructions to subordinate units.

(8) Coordinate combat, CS, and CSS requirements.

(9) Coordinate terrain management for all aviation brigade C^2 facilities.

(10) Keep abreast of CS and CSS capabilities and status.

(11) Submit reports to higher headquarters.

(12) Graphically depict friendly and enemy situations.

(13) Make a continuous estimate of the situation.

(14) Make recommendations to the commander.

(15) Prepare and issue fragmentary orders (FRAGOs), operation orders (OPORDs), operational plans (OPLANs), intelligence summaries (INTSUMs), intelligence reports (INTREPs), and

situation reports (SITREPs).

(16) Maintain communications.
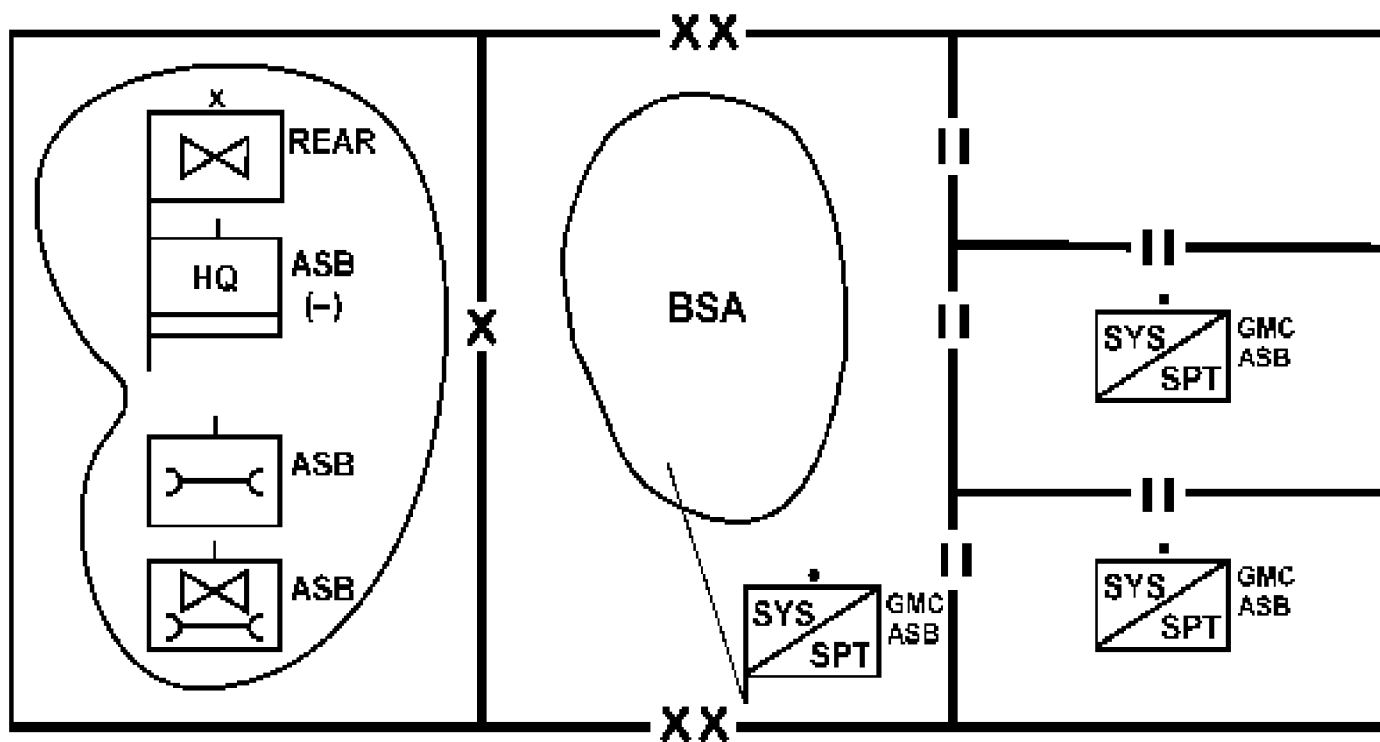
Figure 2–2. Typical disposition of a division aviation brigade and support assets (AVIM and DASB)
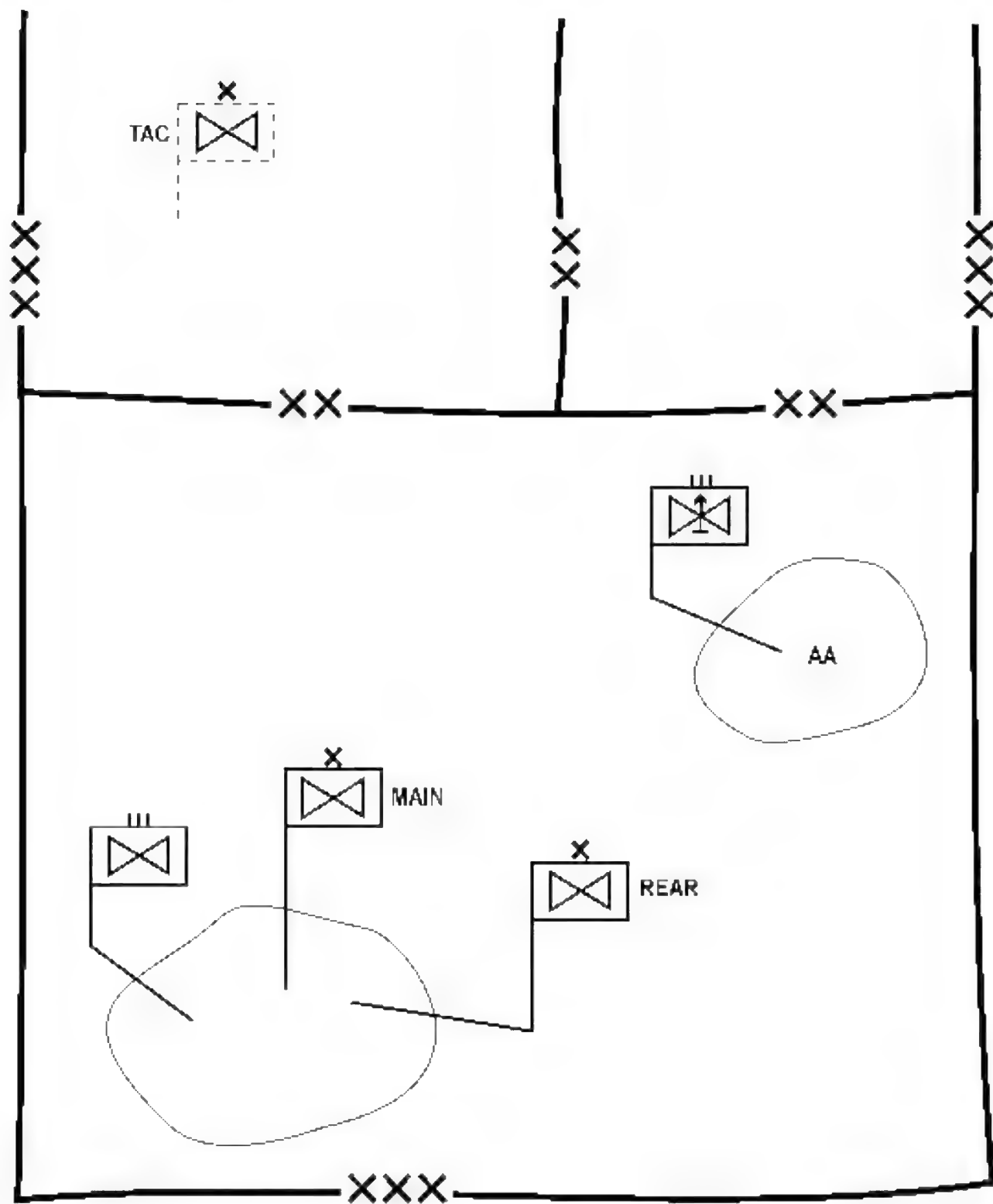
Figure 2–3. Typical disposition of a corps aviation brigade
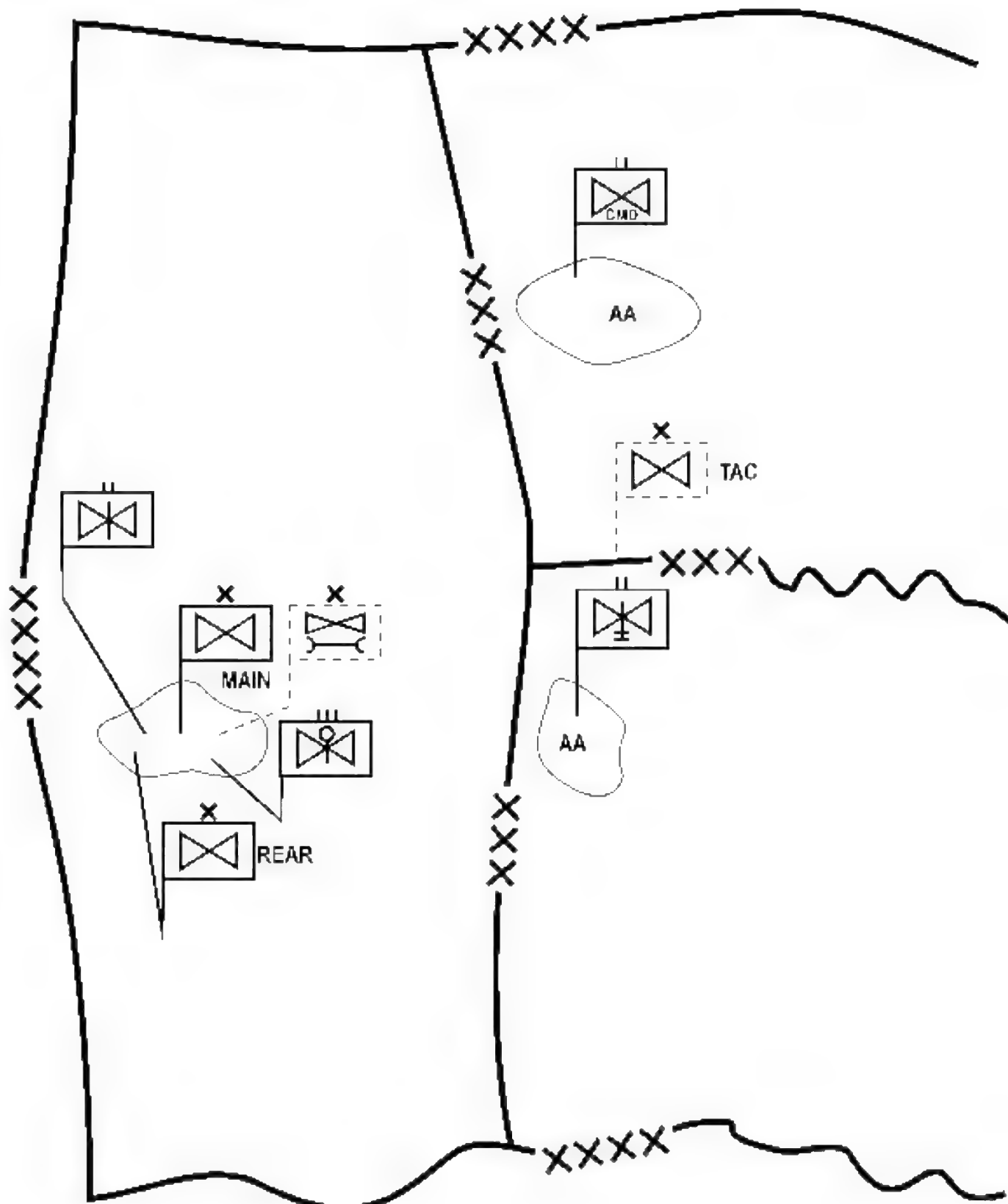
Figure 2–4. Typical disposition of an EAC aviation brigade

500-1,000M

SUPPLY
AREA

LAT
AREA

INGRESS

TOC

NED
AREA

COMMO
REMOTE

MESS
AREA

EGRESS

MAINT
AREA

SLEEP
AREA
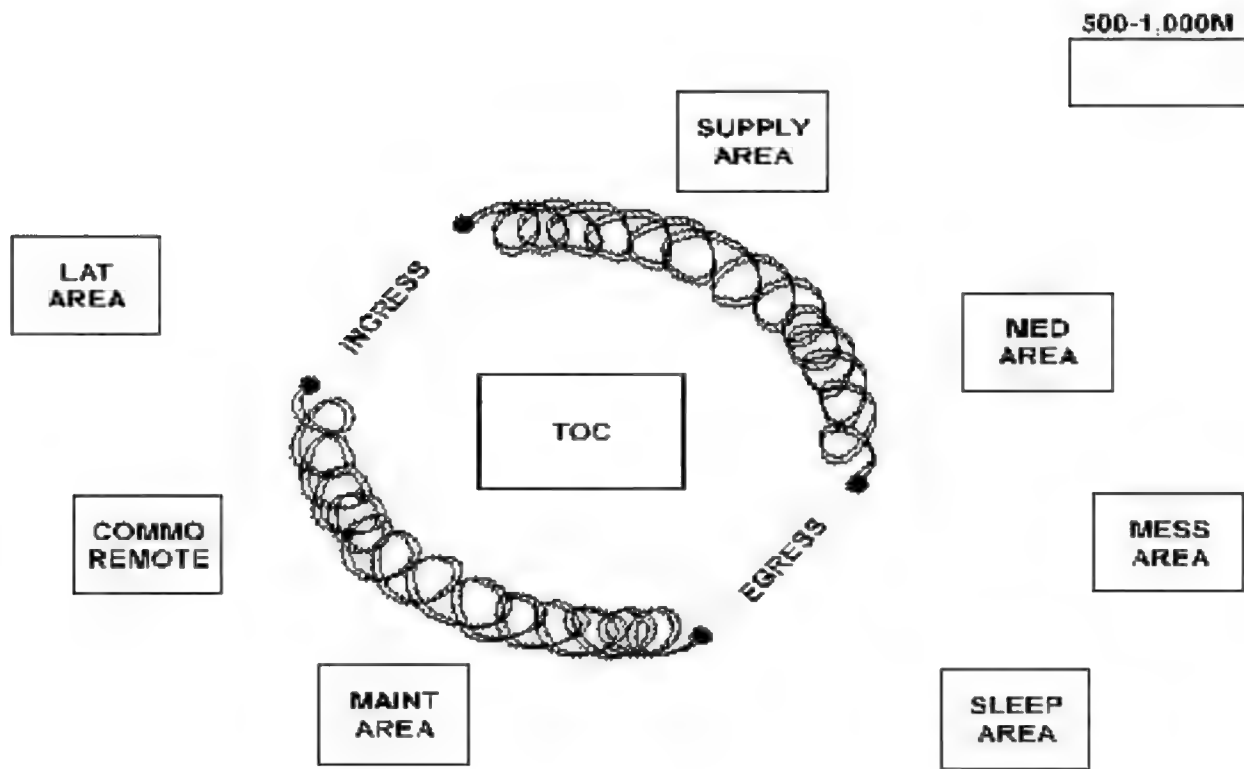
Figure 2–5. Example of main CP

e. Several factors involving both friendly and enemy forces have immediate operational impact. Those that must be monitored by the TOC and communicated to the commander are listed below.

(1) Friendly factors include the—

(a) Changes in the mission or status of the battalion/separate company or higher, subordinate, and adjacent units or the current task organization.

(b) Changes in the status of supporting fires or tactical air priority.

(c) Loss of unit combat effectiveness of a company–size or larger force, imcluding DS or attached units—maneuver, CS, or CSS.

(d) Strength, location, and activity of operational forces down to battalion and separate company level including DS and attached units—maneuver, CS, and CSS.

(e) Status of major organic items significantly affecting combat power.

(f) Class III and V status of adjacent and subordinate units.

(g) Status of friendly or enemy obstacles and contaminated areas.

(h) Employment of smoke by friendly forces.

(i) Employment of nuclear weapons by friendly forces.

(j) Status of the commander's critical information requirements (CCIR).

(2) Enemy factors include—

(a) Contact with or withdrawal of company–size or larger units.

(b) Changes in the location or sighting of company–size or larger units.

(c) Employment of NBC weapons.

(d) Employment of smoke by threat forces.

(e) Appearance of nuclear weapons.

(f) Knowledge of the current location of all ADs.

(g) Location, strength, identification, and activity of units in contact and capability of enemy units to reinforce and support.

(h) Significant changes in enemy logistical capabilities.

f. Operational functions of the TOC should be standardized in the SOP; all personnel should be familiar with them. All of the areas in the TOC should be arranged in a similar manner. This similarity helps when moving about the area during darkness. Some information must be common knowledge. Such information includes generator service schedules, COMSEC changeover times, the order of march for movement, who performs security functions, or what is required when the TOC shelter is erected or wire is laid. Functions include methods of—

(1) Maintaining maps and graphics.

(2) Passing messages.

(3) Receiving and rendering reports.

(4) Servicing generators.

(5) Erecting extensions and camouflage nets.

(6) Maintaining C^{4}I devices.

(7) Maintaining journals

g. The S3 organizes his section to meet the requirements of the situation. In a tactical situation, S2 and S3 activities intermingle. Therefore, the S3, coordinating with the S2, organizes the S2–S3 operations portion of the main CP. This S2–S3 operation is continuous, provides a capability for displacement, and — when required — operates a jump, or temporary, TOC. However, the tactical operations center should be standardized as described for the tactical CP.

h. Considerations for the location of the TOC are discussed below.

(1) The S3 selects the general location of the TOC based on METT–T. The most important consideration for selecting a TOC site is good communications with higher, subordinate, and adjacent headquarters. Accessibility to road networks, cover, concealment, and drainage are other considerations. The S3—coordinating with the HHC commandant and signal officer—normally selects the TOC location. Several alternate TOC sites should be selected and, when possible, reconnoitered.

(2) During offensive operations, the TOC should be well forward. In fast–moving operations, the TOC may have to operate on the move. Staff coordination and communications are degraded when the TOC is moving; thus, both the TOC and the units it controls must train to operate in this mode.

(3) During defend and delay operations, the TOC should be located farther to the rear to minimize its vulnerability. The exact location will depend on the terrain, the road network, and the ability to communicate.

(4) When possible, the TOC should be located in built–up areas. Barns, garages, and warehouses minimize the need for detailed camouflage; basements offer protection from enemy fires. Covering windows and operating in basements enhance noise and light discipline. Built–up areas also reduce infrared and electromagnetic signatures; therefore, the TOC does not have to move as often.

(5) When built–up areas cannot be used, the TOC should be located on reverse slopes of terrain features. This terrain provides cover and concealment from both ground and air observation and fires. The ground must be firm enough to support vehicle traffic, provide adequate drainage, and allow space for vehicle dispersement.

(6) The TOC should be located near routes with relatively easy access to the area as well as to higher and subordinate headquarters and rear areas. Prominent terrain features or major road junctions should be avoided; thus, the enemy cannot easily determine the TOC location.

(7) When required to move with tactical operations, the TOC may displace as a whole or by echelon. The method selected depends on METT–T, the distance to be moved, and communications requirements. Movement somewhat degrades the capability of the TOC; however, the brigade and subordinate command nets are to be maintained. All movement plans are designed with this requirement in mind.

(8) Before the TOC displaces, the brigade S3 establishes the general area for the new TOC. The HHC commandant, XO, and S3 or assistant S3—along with the signal officer—conduct detailed reconnaissance. An NBC reconnaissance team also normally accompanies the advance party. The party identifies possible routes and sites with cover and concealment. These locations must provide effective communications and accommodate all vehicles and equipment. Several possible sites must be identified, reconnoitered, and planned to provide flexibility during combat operations.

(9) Sketch maps are made; these show the exact element sitting within the new CP location. The TOC places a net call to inform subordinate headquarters of the impending move and to shift reporting and coordinating functions to the tactical CP during the displacement (digital connectivity between higher and subordinate units may negate this requirement). Breakdown and march orders of TOC elements then take effect as prescribed in the SOP. A displacement team—which consists of the brigade XO, signal officer, assistant S3, and selected section guides—departs for the new site to finalize occupation plans and to aid in the reception of the TOC main body as the advance party. The main CP normally displaces in two echelons. The TOC, accompanied by support elements led by the HHC commandant, has priority on routes. When the HHC commandant and the TOC elements occupy the new location, the main CP support element—led by the command sergeant major—displaces. During displacement, TOC elements should continue to monitor the battle and update situation maps and information displays. These tasks reduce the time required to become operational again.

(10) A TOC is a major source of electromagnetic and infrared energy. If the TOC is not moved often, the enemy can fix its location and place indirect fire or close air support (CAS) on it. The larger and more elaborate the establishment, the less rapidly the TOC will be able to move. The TOC should travel light and move often. However, over time, too frequent movement hinders TOC operations.

(11) The brigade TOC will be one of the most lucrative targets for the enemy. The first line of

security for the TOC is to prevent the compromise of its location through operational security (OPSEC) and communications security measures.

(12) The HHC commandant is responsible for the defense of the TOC. He should first establish a perimeter defense around the TOC at a distance of about 50 to 100 meters. On order, the perimeter would then be occupied by TOC and support personnel. The perimeter may includes fighting positions, obstacles, and protective wire barriers. During operations, the sleep area should be organized so that personnel sleep near their positions on the perimeter.

(13) Because of the TOC's austere personnel structure, its security is achieved mainly through passive measures. Passive measures include proper cover and concealment, and adherence to OPSEC measures. Active measures include having selected HHC and attached personnel available to secure primary entrances and exits and to conduct surveillance of likely avenues of approach. Other measures include activating reaction forces upon an identified incursion. Reaction plans are rehearsed and executed upon a predetermined alarm and rally point from which these reaction forces may be directed to counter the threat. All personnel should also be given a detailed briefing of their security duties. A high degree of security must be maintained, even during displacement, and security measures refined afterward. The TOC security element generally—

(a) Establishes initial security.

(b) Positions crew–served weapons and vehicles.

(c) Positions remaining personnel.

(d) Clears fields of fire.

(e) Establishes a wire communication system with subordinate and adjacent units, as applicable, and mobile subscriber equipment (MSE) communications with higher. If available, MSE communications will be established with subordinate units as well.

(f) Emplaces obstacles.

(g) Prepares fighting positions.

(h) Prepares alternate and supplementary positions.

(i) Selects and prepares routes for supply and evacuation.

(14) Units normally conduct a daily stand–to. The purpose of stand–to is to establish and maintain a combat–ready posture for combat operations. Stand–to includes all steps and measures necessary to ensure maximum effectiveness of personnel, weapons, vehicles, aircraft, communications, and NBC equipment. Units will assume a posture during stand–to that enables them to commence combat operations on short notice. However, aviation unit operations may dictate that stand–to functions not be performed as described; however, security cannot be neglected.

(15) In defending the TOC, all personnel must know the locations of their positions. They must ensure that the positions are well prepared and are mutually supporting. The alarm to occupy fighting positions should be identified and announced. Occupation of these positions should be practiced at least once after personnel occupy a TOC site and practiced routinely according to the unit SOP.

(16) NBC alarms must be posted. Appendix C of this manual addresses NBC planning in detail.

2–5. TACTICAL COMMAND POST

a. The commander and the S3, or the assistant S3, normally establish the tactical CP. This CP is temporary and staffed with the minimum personnel necessary to conduct current operations and perform limited tactical planning procedures. The brigade tactical CP is the forward echelon of the brigade headquarters.

b. The tactical CP must be staffed to operate for extended periods. According to METT–T, the commander designates personnel to operate the tactical CP. These personnel may include the commander, S3, TACOPS officer, assistant S3, FSO (or representative), S2 (or representative), and ALO. The tactical CP is tailored to the situation; it is configured based on available vehicles, C^2 aircraft, and other assets. The S3 is responsible for staff coordination and functioning of the tactical CP. The C^2 aircraft can provide the commander with a TAC CP as operational time (OPTEMPO) demands.

c. If the tactical CP is located close to the battle, the commander can establish face–to–face contact with subordinate, adjacent, and higher commanders. The tactical CP is limited in size, manning, and electronic capabilities. It can be displaced rapidly and often, depending on METT–T. A tactical CP should normally be smaller than a battalion TOC.

d. The commander conducts the current operation from the tactical CP, assisted by a small staff, which provides combat–critical information only. The tactical CP staff also—

> **(1)** Controls combat, CS, and CSS forces.
>
> **(2)** Acquires, develops, and disseminates combat intelligence of immediate interest to the commander.
>
> **(3)** Provides priorities and planning guidance for CS and CSS to the brigade XO, located in the TOC.
>
> **(4)** Provides routine reports and limited planning when the TOC is being displaced.
>
> **(5)** Maintains communications with higher headquarters and supported ground units.
>
> **(6)** Issues mission changes—OPORDs or FRAGOs.

e. The brigade HHC commandant provides support for the tactical CP. He normally makes two trips to the tactical CP daily—possibly coinciding with delivery of hot breakfast and supper meals—to bring water, fuel, maintenance support, and supplies.

f. Because of the frequency and rapidity of displacement required, the primary means of communication used at the tactical CP is frequency modulated (FM)–secure. Communications from the tactical CP normally will be FM, ampliture modulated (AM), or improved high frequency (HF) radio, or may also include MSE. Operational radio nets are—

> **(1)** The higher echelon command net.
>
> **(2)** The brigade command net.
>
> **(3)** The higher echelon operations and intelligence (O&I) net.
>
> **(4)** The brigade O&I net.
>
> **(5)** The USAF coordination nets—FM, HF, ultra high frequency (UHF), and very high frequency (VHF).

g. Proper radio and telephone procedures must be strictly enforced so that important, time–sensitive

information can reach the brigade commander. Normally, only commanders, XOs, and S3s communicate on the command net. All routine reports are sent through the operations and intelligence net. The tactical CP must be situated to ensure continuous communications with the higher echelon tactical CP, brigade main CP, and subordinate or supporting TOCs.

h. When the commander and the S3 are away from the tactical CP, the tactical CP staff monitors the current operation. Tactical CP personnel update all maps and reports. When the command group returns, it can then receive an accurate portrayal of the brigade situation. Tactical CPs are especially useful during operations such as deep attacks or passage of lines.

i. The brigade tactical CP normally deploys with aircraft provided by the command aviation company or by vehicles supporting the main CP. A built–up area requires less organic equipment and fewer personnel. It also allows tactical CPs to be more rapidly displaced. When deployed in a field site, a tactical CP requires more concealment such as the use of camouflage nets. Tactical CPs are normally austere. They are established based on METT–T and assigned equipment. Standardized formats and procedures for tactical CP establishment expedite the C^3 of the brigade. When possible, the tactical CP will be located within a built–up area so that it can—

(1) Reduce infrared and visual signatures.

(2) Harden the CP location.

(3) Provide hasty living accommodations for assigned personnel.

(4) Provide work space for tactical activities.

j. A UH–60 Black Hawk, equipped with a C^2 console, or the more advanced A^2C^2S should be considered as a TAC CP for operations requiring increased mobility and flexibility. The A^2C^2S is a UH–60, with a console of common networked computers, combat net radios (CNRs), HAVEQUICK UHF radios, satellite communications (SATCOM), HF radios, and a large digital map display on a flat panel screen. It will provide real–time situational awareness and mission planning capability to maneuver commanders at all levels in a highly mobile command and control platform.

k. Displacement of CPs must be planned to ensure continuous information flow and C^2 of brigade operations. Having a tactical CP and a TOC enables the brigade to displace CPs and to maintain control of the current operation. How often CPs and associated elements are displaced depends mostly on the enemy's ability to locate and attack CPs by fire or EW and on the need to maintain communications.

l. Because of certain battlefield conditions, the tactical CP may have to move often. Control is usually passed to the main CP during the move; however, the tactical CP should be able to operate on the move. The tactical CP may displace when the command group is deployed forward. During defensive operations, the commander can take key staff assistants with him in ground or air transport and move to the main CP to control the battle until the tactical CP is ready to resume control.

2–6. TACTICAL OPERATIONS CENTER OPERATIONS

An efficient TOC operation is developed only by a well–trained staff and commander. Extensive training in simulated field environments will create the technical expertise and staff cohesion that will enable the brigade to operate effectively on today's dynamic battlefield. The organization and function of CPs have two key dimensions. First is the internal flow of information and staff coordination; thus, the commander will receive timely information and recommendations. Second is the external flow of information and command decisions among the CPs at all levels. Information and command decisions must be passed at once to CPs within the command as well as to higher and adjacent commands.

a. *Continuous Operations.* FM 22–9 contains a detailed discussion on continuous operations.

(1) Human fatigue probably degrades performance the most. Performance and efficiency begin to deteriorate after 14 to 18 hours of continuous work; they reach a low point after 22 to 24 hours. Performance improves somewhat during the next 8 to 10 hours. Then it begins to decrease again. For most tasks involving perceptual skills, an individual's performance is degraded after 36 to 48 hours. Effectiveness ceases after 72 hours of continuous duty. An NBC environment also degrades performance. Appendix C and paragraph (2) below further describe this information.

(2) The commander must be able to recognize the signs of sleep loss or performance degradation. Noticeable effects are—

- Depression.
- Irritability.
- Errors of omission.
- Lapses of attention.
- Erratic performance.
- Slower reaction time.
- Short–term memory impairment.
- Impairment in learning speed.
- Increased time to perform a known task.

(3) Periodic breaks and mild exercise can counter the effects of sleep loss for staff personnel. Among combat crews, commanders may rotate tasks if the crews are cross–trained.

(4) Schedules enhance personnel performance by allowing breaks for rest. The example of a TOC schedule at Table 2–1 is simple. It represents one method that may be used. Personnel become accustomed to working with one another. When this shift schedule is used, shifts should overlap at least 30 minutes to allow the personnel going off duty to brief the incoming shift personnel. If a unit has a daily staff update meeting scheduled, this meeting may be the best time to change from one shift to another. Thus, the new crew can begin its shift fully briefed. At the next change of shift, another briefing is conducted for TOC personnel only. A new shift must always be briefed before its shift begins. This schedule also eases feeding operations because it allows standardized hours to be set.

Table 2–1. Example of a TOC Schedule

Schedule 1

	A Shift[2]	B Shift
Op Rep	Assistant S3	S3
	Op Sgt[4]	Asst Op Sgt
	TACOPS OFF	
Intel Rep	S2	Tac Intel
	Sr Intel Analyst	Intel Analyst
Cml Rep	Cml Off	Cml NCO
Ops RTOs	RTO	RTO
Clerk-Typist	Clerk-Typist S3	Flt Op Spec
Intel RTO	Intel Analyst	Intel Analyst

Vehicle/Gen Op	S3 Driver	S2 Driver
FS Rep[5]	FSO	FS NCO or Spec
Engr Rep[5]	Bde Engr	Op Sgt
AF Rep[5]	ALO	TACCS
AD Rep[5]	AD LNO	AD LO Sgt
S1/S4 Rep[1]		
Signal	BSO	Comm Chief

---

[1]Liaison teams will augment as available.
[2]Assistant S3 is A shift officer in charge.
[3]S3 (Air) is B shift officer in charge.
[4]Shift TOC noncommissioned officer in charge.
[5]When assigned.

---

b. *Performance Degradation in an NBC Environment*. C^2 may suffer greatly in an NBC environment because of leader exhaustion. Leaders must pace themselves, delegate, and observe a strict work–rest regimen. Forced liquid intake—especially under NBC conditions—minimizes dehydration, stress, and poor performance.

(1) Communications will also be degraded in an NBC environment. Radio transmissions will increase and verbal face–to–face communications will become less effective.

(2) NBC conditions may also hinder combat operations. The operational tempo will be greatly decreased. Direct fire and target/objective acquisition and identification may also be hampered. Indirect fire systems not under these conditions will be relied on heavily. Strong leadership is necessary under these conditions, as in other battlefield conditions, to reduce stress and maintain a combat–effective unit.

c. *TOC Personnel Update Briefing.* Before personnel depart the TOC shift, the new shift must be briefed in detail. The briefing should highlight the current situation, significant events during the past 12–hour shift, and any ongoing issues that must be resolved by the next shift. A possible format for the briefing is shown in Table 2–2.

:

Table 2–2. Recommended update briefing format

CURRENT OPERATIONS

- **SITUATION.**
  - Weather—area weather forces (S2).
  - Enemy forces—enemy situation, intelligence overlay (S2).
  - Friendly forces—operations situation map (S3).
  - Attachments/detachments—current battalion/task force organization (S3).
- **MISSION—BRIGADE OPORD (S3)**.
- **EXECUTION—OPERATIONS SITUATION MAP, CURRENT OPORD (S3)**.
  - Fire support—fire support overlay (FSE).
  - Engineer support—obstacle overlay (Engr).

- AD support—AD overlay (AD).
- TAC air support—(ALO).
- MOPP level and operational exposure guidance.
- Chemical events within last 24 hours.
- **SERVICE SUPPORT—PERSONNEL REPORT, COMBAT STATUS CHART, LOGISTICS, AND MAINTENANCE OVERLAY (S1, S4).**
- **COMMAND AND SIGNAL.**
  - Command—operations situation map (S3).
  - Signal—signal operation instructions, communications status, challenge, and password (Comm Officer).

FUTURE OPERATIONS

- **BRIGADE/BATTALION/TASK FORCE OPLAN/OPORD (S3).**
  - Contingency missions (S3).
  - Significant problems in last 24 hours (All).

---

d. *Operational Techniques.* TOC personnel must follow procedures outlined in unit SOPs to streamline operations and provide continuous information flow. Techniques to fulfill these requirements are outlined below.

(1) *Journals.* The assembled journals of the staff give a complete picture of the unit's operations. These journals are a permanent record. Normally the S2 and S3 sections operate a combined log. Other staff or special staff elements compile their own journals. Message forms, blank report format sheets, and preformatted orders must be prepared in duplicate to aid the information process. The flow chart in Figure 2–6 depicts an efficient TOC action chain that ends in a journal entry.

```
                    ┌─────────────────────────┐
                    │    MESSAGE RECEIVED      │
                    └─────────────────────────┘

        S3                                              S2
     SHIFT OFF ◄ ─ ─ ─ ─ ─ INFO COPY GIVEN ─ ─ ─ ─ ─ ► SHIFT OFF

        │                                                 │
        ▼                                                 ▼
     ACTION:                    INFO                    ACTION:

   MAP POSTED ─ (IF USED) ─ ─ ► OTHER ◄ ─ ─ (IF USED) ─ MAP POSTED
   MSG PASSED                   STAFF                    MSG PASSED

                                 XO
                             INFO/ACTION

                                 │
                                 ▼
                              OPS SGT
                               POSTS
                              JOURNAL
```
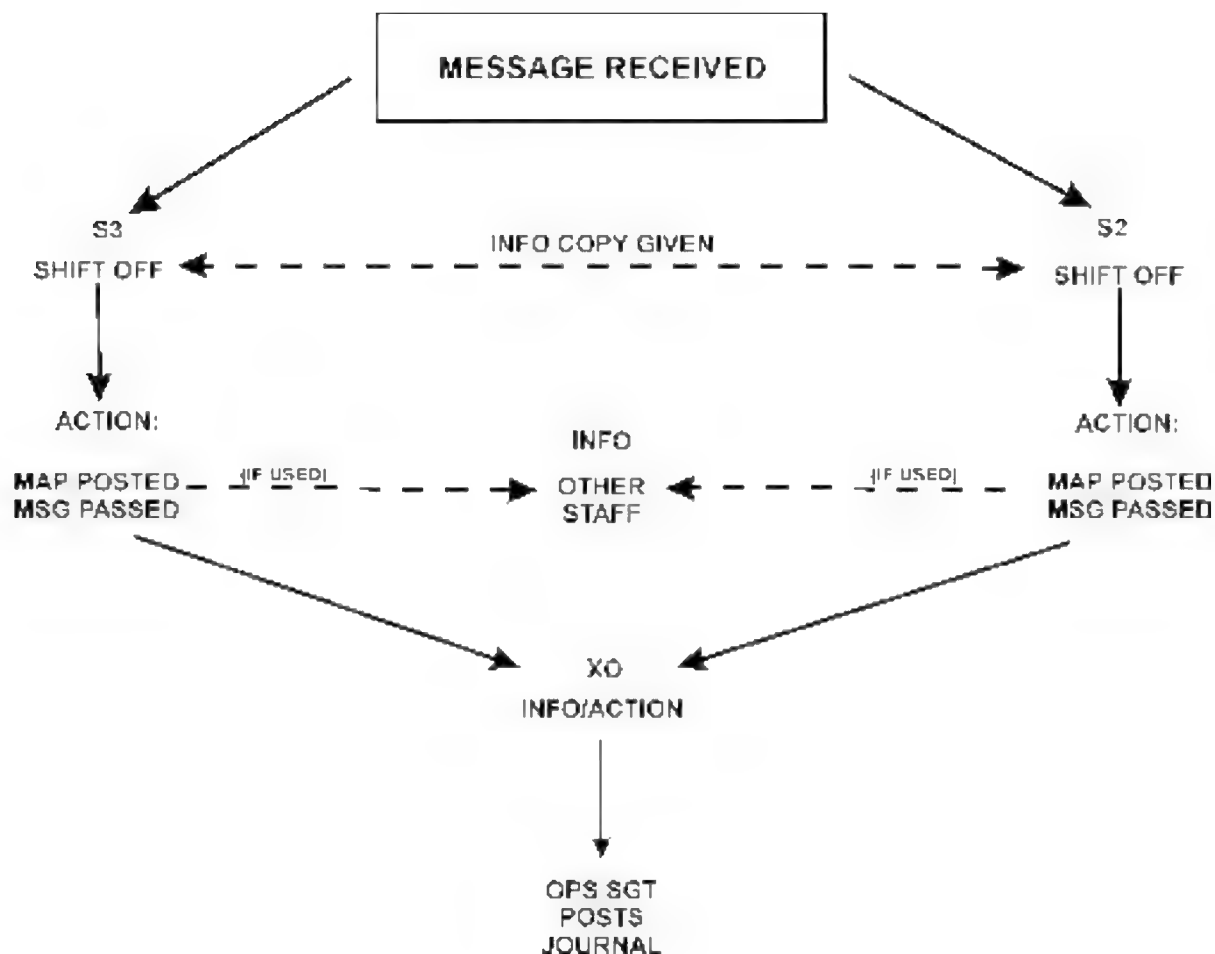
Figure 2–6. TOC action chain

(2) *Current operations maps/display screens.* At the brigade, only key elements of information must be extracted and tracked so that the commander has combat–critical information. The S2 and S3 should use the same current operations map or computed generated display screen to display an easily understandable portrayal of the flow of battle. The automated systems that will update and display this information will be discussed in paragraph 2–4. Other control measures may be required to command and control the battle. These measures include phase lines (PLs), contact points, passage points, lanes, routes, AAs, and battle positions (BPs). Figure 2–7 shows an example of a map board design. All map boards within the TOC should be standardized so that graphic overlays are interoperable. At least these items of information should be depicted on the current operations situation map/display screen. Symbology that portrays the current friendly/enemy situation must include—

(a) Six–digit locations for subordinate regiments and groups and their subordinate battalion.

(b) Six–digit locations for corps and division TOCs and TACs.

(c) Four–digit center–of–mass locations for adjacent friendly units (battalions and larger).

(d) Six–digit center–of–mass locations for elements in the brigade support area (BSA).

(e) Six–digit center–of–mass suspected locations for threat battalions, regiments, air defense artillery (ADA), and any high–priority targets (date–time group of the report should be centered below the symbol).

(f) Six–digit center–of–mass suspected locations for the regimental artillery group and

division artillery group.

(g) Symbols that portray boundaries and front line trace of divisional and subordinate units and suspected threat boundaries.

(3) *Information Display.* An information display may be required to supplement details contained on the situation map/display screen. This display makes information available that is not suitable for posting on the situation map. Information associated with the situation map is located adjacent to it for easy posting and viewing, or is easily accessible through a continuously updated data base. Figures 2–8 through 2–13 provide several examples of display and chart formats. These may be used to standardize TOC information displays. Typical information displays are easily updated, readily understandable charts that depict essential information. A display that is not up to date is misleading and useless. Suggested informational displays normally required in a brigade TOC are—

- Task organization.
- Mission and commander's intent (concept of operation).
- Personnel status (includes cumulative aircrew status of subordinate units).
- Logistical status (specific Class III/V status of subordinate units).
- Combat power.
- Communications status.
- CP locations.
- Tactical intelligence and weather.
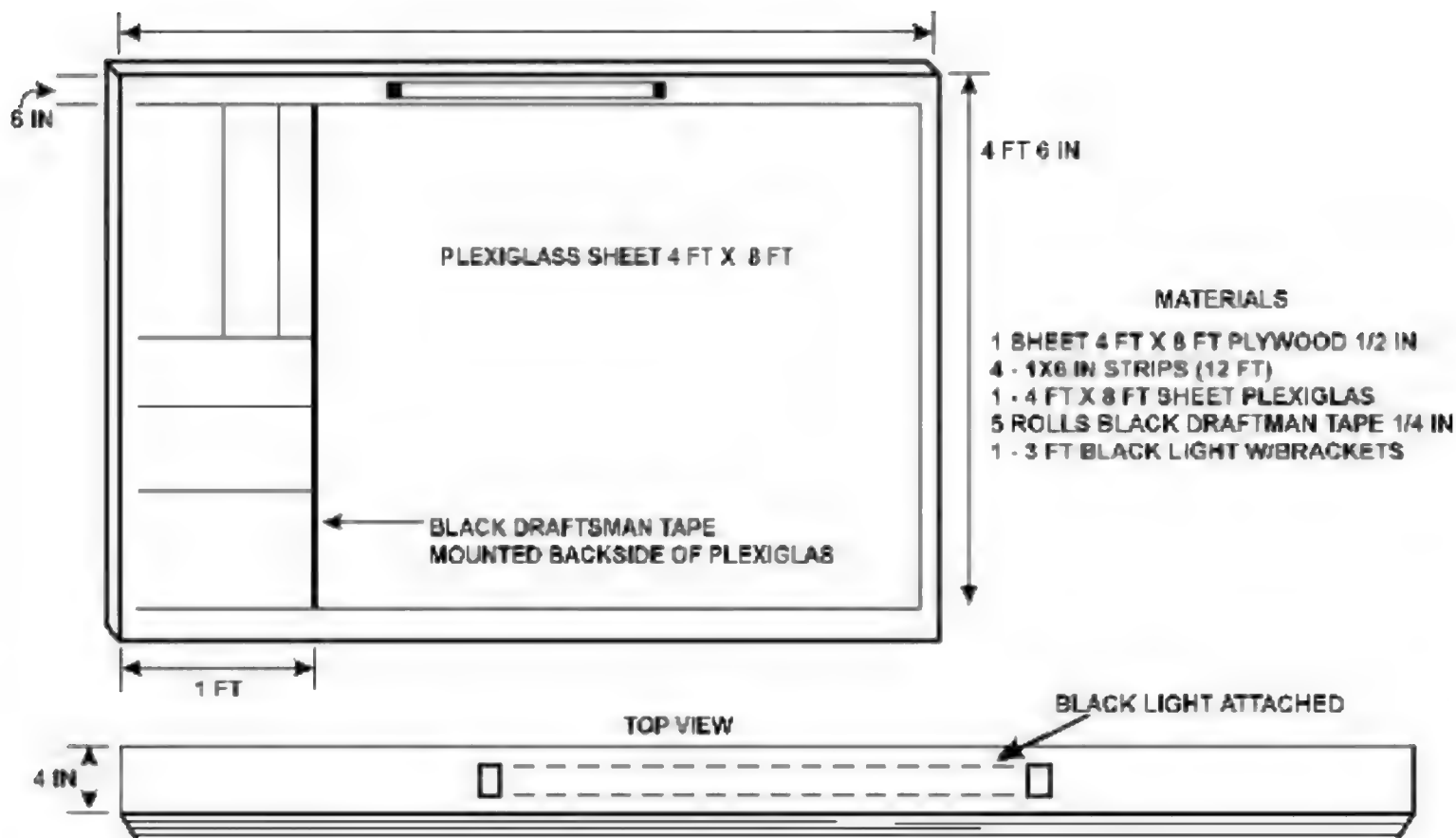
Figure 2–7. Example of a map display (not automated)

TASK FORCE _____		
ELEMENTS OF CBT POWER	MOPP STATUS 1 DTG _____ 2 3 4	MISSION _____ DTG _____
IN ARMOR ARTY ATK HEL MTR TAC AIR SHORAD -CHAPARRAL -VULCAN -MANPADS ENGR SCOUTS GS-R C&J CSS	BATTLE RESOURCES STATUS GREEN 80-100% AMBER 60-79% RED 40-59% BLACK 0-39% REMARKS	CDR'S INTENT (CONCEPT OF THE OPERATION) TASK ORGANIZATION

Figure 2–8. Example of a task organization display

UNIT	UNIT TOTAL		CRITICAL SHORTAGES MOS/NO.SHORT	NO. OF CASUALTIES			KEY PERS LOSSES		
				KIA	MIA	WIA	OFF	WO	ENL

REMARKS:

Figure 2–9. Example of a personnel status chart

PLEXIGLASS ON 1/4 IN PLYWOOD, LIGHT GRAY BACKGROUND

◄──────────────────────── 3 1/2 FT ────────────────────────►

UNIT	COMBAT POWER		WPNS SYSTEM STATUS				FARP STATUS		COMM STATUS (GREEN, AMBER, RED)	AIRCRAFT STATUS				
	CDR / XO	LOC	AUTH / OH	AUTH / OH	AUTH / OH	AUTH / OH	LOC	CL III / CL V						
REMARKS:														

Figure 2–10. Example of a combat power status chart

SUPPORT PRIORITIES								AVIATION			PERSONNEL STATUS				
UNIT	FA	MTR	CAS	AD	ENGR	GS-R					UNIT	OFF	WO	ENL	REMARKS
TM															
TM															
TM															
TM															
TM															
TM															
TM															
TM															
CBT TRNS															
TF TOTAL															

REMARKS:

TF PRIORITY LISTING:

CAS

	TYPE OF		
TOTAL	ACFT	ORD	TGT

ADA WARNING	WPNS CTRL
DTG _____	DTG _____
RED	FREE
YELLOW	HOLD
WHITE	TIGHT

REMARKS:

Figure 2–11. Example of a combat priorities and personnel status chart

PLEXIGLASS ON 1/4 IN PLYWOOD, LIGHT GRAY BACKGROUND

← 3 1/4 FT →

2 1/2 FT

PIR/EIR PRIORITIES	COLLECTION TASKS			
	TASK	SOURCE	TIME	
1.	1.			
	2.			
2.	3.			
	4.			
3.	5.			
	6.			
4.	7.			
	8.			
5.	9.			
6.	REMARKS:			
ORI:	SIGNS/COUNTERSIGNS			

Figure 2–12. Example of a tactical intelligence display

Figure 2–13. Example of a weather status display

(4) *Administrative Requirements.* An efficient TOC will have clearly defined administrative procedures in an SOP to speed the information flow and directives to higher and subordinate headquarters. Normally, the operations sergeant is the key individual for these tasks. Enough office supplies must be stocked to allow for extended operations. Basic loads should be established and monitored for all needed supplies. Blank required report formats should be prepared to expedite reporting. TOC personnel must be trained in receiving, consolidating, and transmitting required reports. Drills must be established for reproducing orders in a field environment. Each player in the TOC must know his role. Orders should be handwritten and reproduced rapidly so that planning time for subordinate units is maximized. Organic vehicles, communications, and all auxiliary equipment must be properly maintained and systematically checked to ensure combat readiness. Responsibilities must be fixed and preventive maintenance checks and services conducted routinely.

(5) *Eavesdrop System.*

(a) The eavesdrop system is used during all tactical operations by all levels from brigade down to the company. This system requires all radio stations to monitor and to send message traffic on a given net, even if they are not the direct recipients of the message. When the corps or division uses MCS or MSE, eavesdropping is not possible. Figures 2–14 through 2–16 depict how the eavesdrop system works within the brigade command, O&I, and administrative and logistics nets. The procedures within each subordinate unit's net are the same as discussed in the brigade eavesdrop.

(b) Situation reports (SITREPs) or other *command net traffic* should be sent from subordinate commanders or S3s to the brigade commander or S3 located forward with the command group or in the tactical CP. Command groups of other attached units or units

under OPCON and their TOCs also monitor the traffic and update situation maps to understand the intent of operations. Therefore, the amount of radio traffic emanating from TOCs is reduced; thus, enemy direction–finding efforts become less successful.

(c) Information passed on the *operations and intelligence (O&I) net* is not monitored by the brigade and subordinate commanders. The unit XO operating in the TOC must relay the critical information that is passed on the O&I net to the commander. Also, the S1, S4, and AMO at the brigade rear CP monitor the operations and intelligence net, if possible; or the S1 or S4 representative at the TOC relays this information to the brigade rear CP. Thus, the administrative and logistics center can anticipate critical support requirements and problems before subordinate maneuver units can request assistance on the brigade *administrative and logistics net.*

(d) The brigade command group, tactical CP, and TOC must monitor the *administrative and logistics net.* The S1 and S4 also must keep the XO updated on the current and future administrative and logistics situation. This may also be accomplished with S1/S4 liaison personnel.

2–7. BRIGADE REAR COMMAND POST

The brigade rear CP coordinates the CSS required to sustain the brigade; it may be located within the EAC, corps, or division support area or elsewhere in the rear area of the AO.

a. The senior in rank or otherwise designated individual, normally the S4 or S1, is the aviation brigade rear CP commander. The rear CP commander also is responsible for the security of rear area units of the aviation brigade; he ensures that they are integrated into an established base or base–cluster defense for mutual security. The brigade XO monitors the operations of the rear area. The S4 and S1 maintain continuous contact with the main CP to coordinate the required support. They also coordinate extensively with higher echelon support command elements for their respective support functions.

b. The rear CP also has other responsibilities. These include conducting rear combat operations against Level I and II threats—as described in Chapter 3—and serving as the alternate main CP.
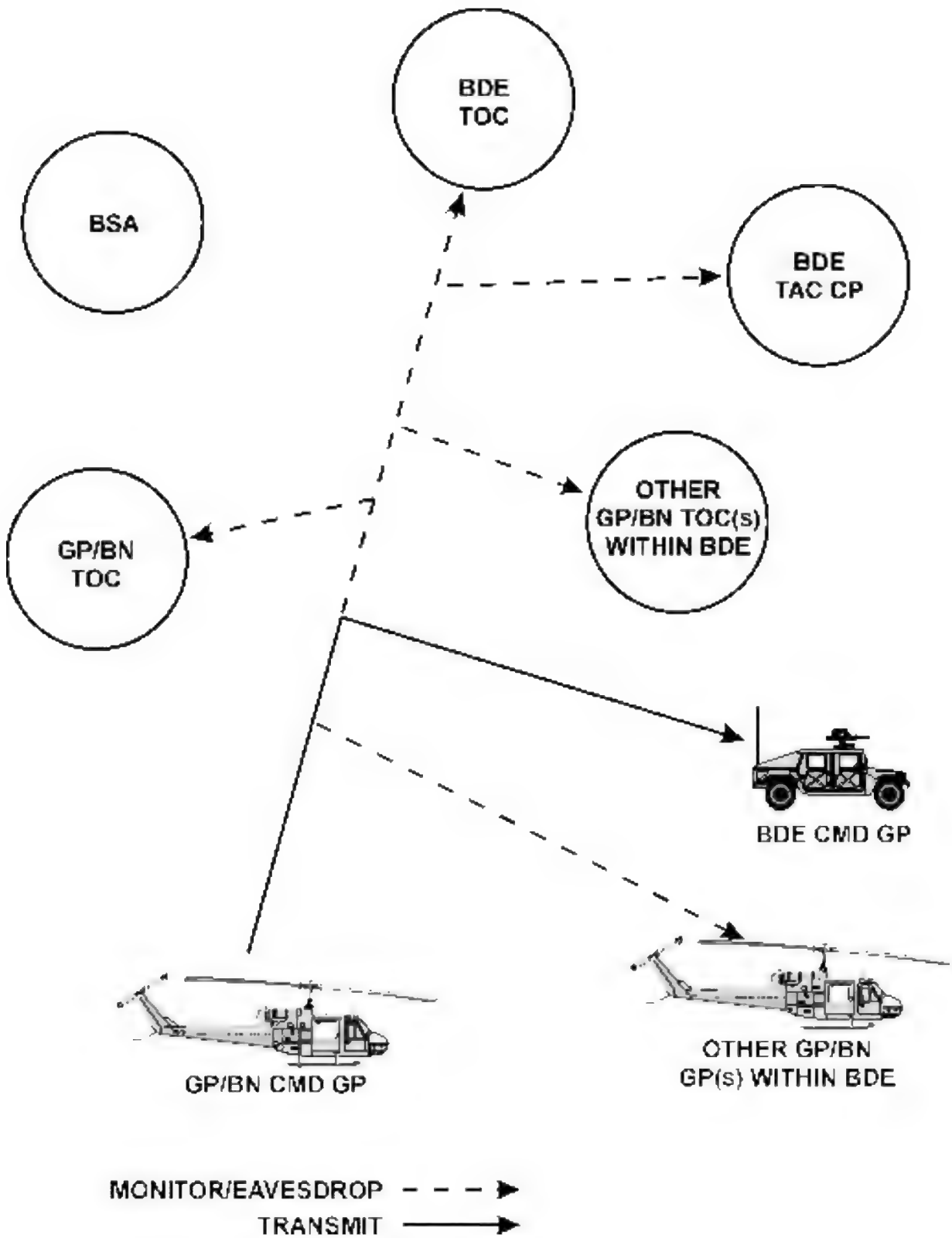
Figure 2–14. Brigade eavesdrop system, command net—lower to higher

Legend:
- MONITOR/EAVESDROP – – – ▶
- TRANSMIT ⟶

Circles/nodes: BSA, BDE TOC, BDE TAC CP, GP/BN TOC, OTHER GP/BN TOC(s) WITHIN BDE, BDE CMD GP, GP/BN CMD GP, OTHER GP/BN GP(s) WITHIN BDE
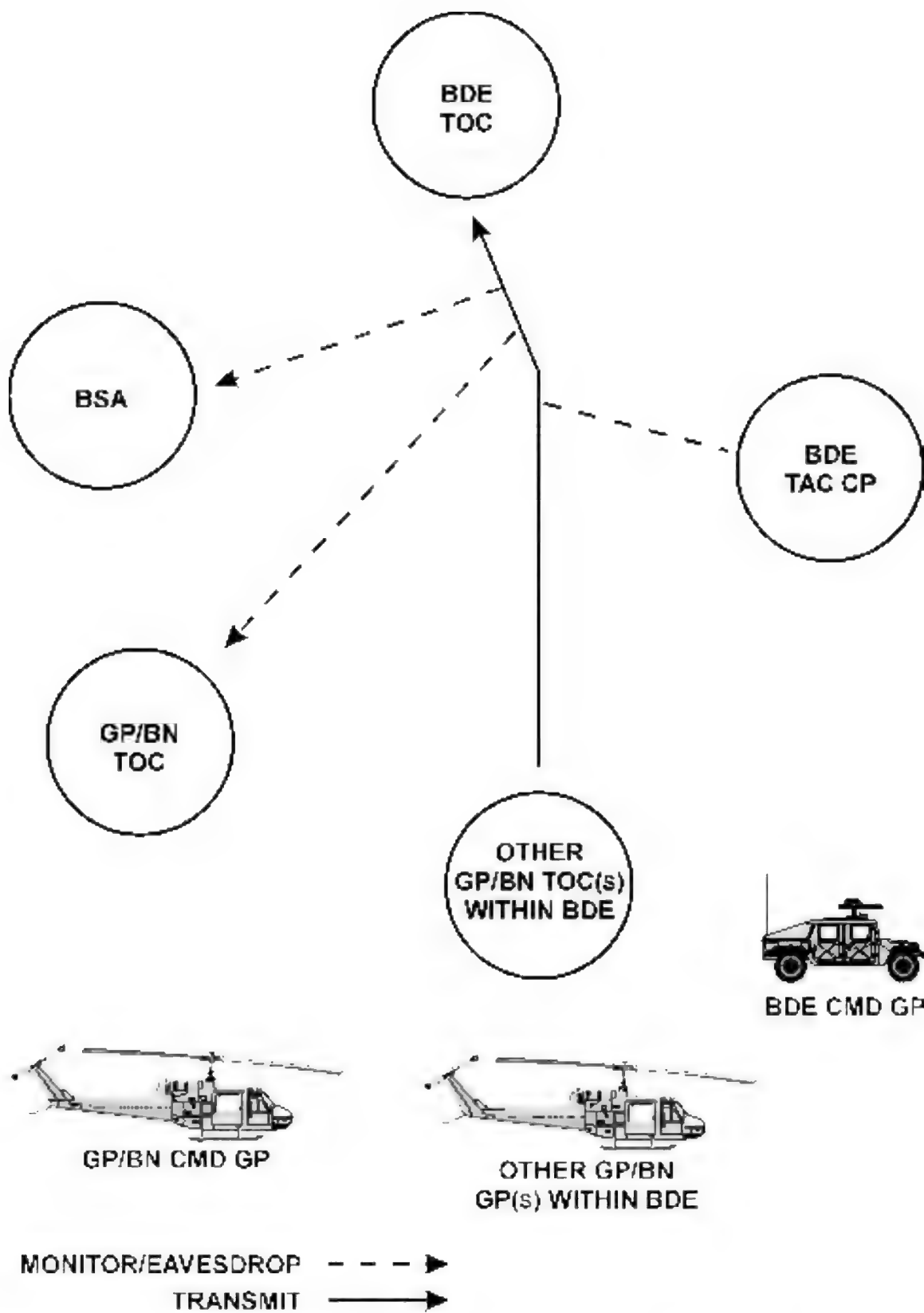
Figure 2–15. Operations and intelligence net—lower to higher

MONITOR/EAVESDROP ————————▶
TRANSMIT — — — ▶
ENTER NET AS REQUIRED ▭▭▭▭▷
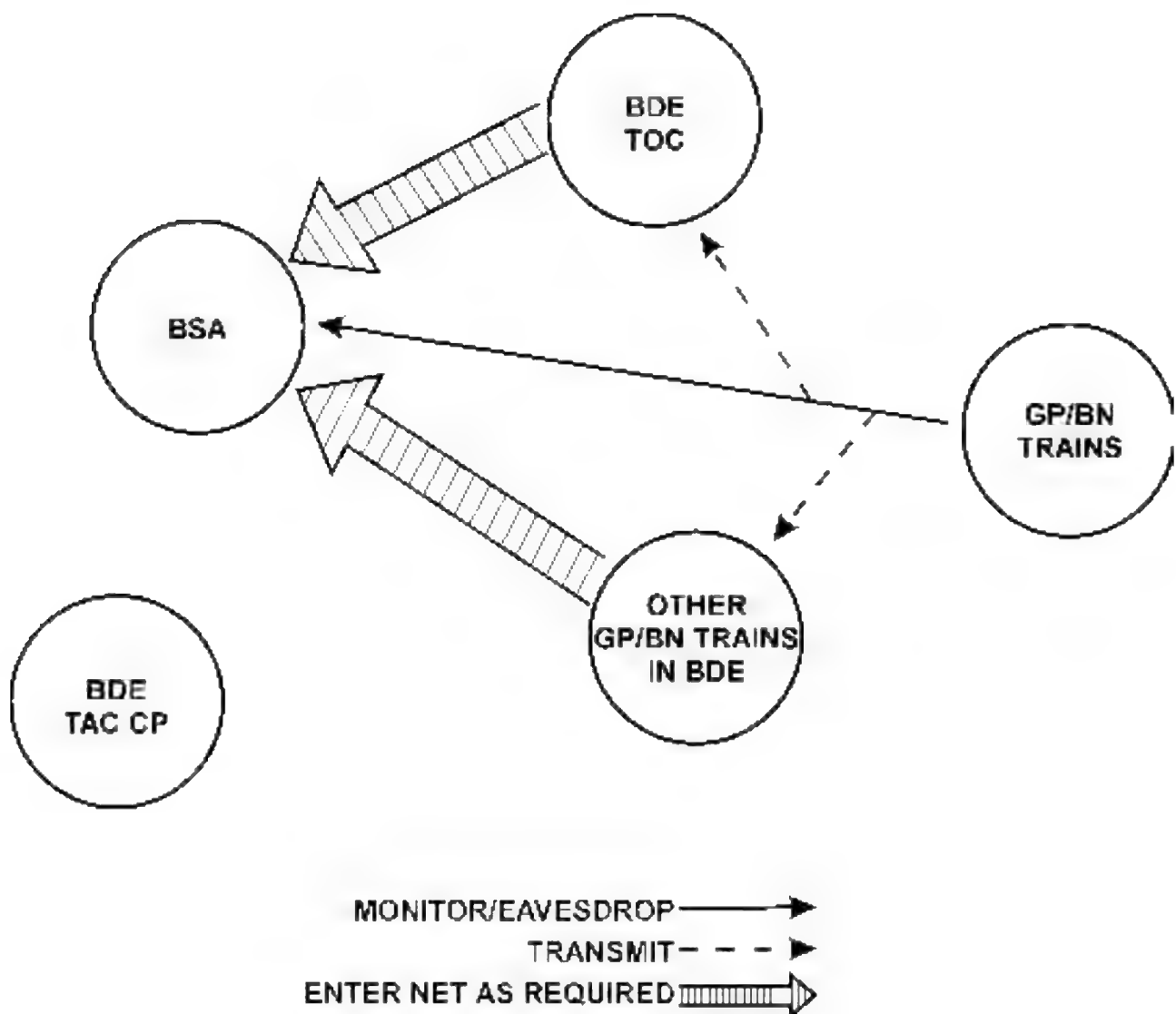
Figure 2–16. Administrative and logistics net—lower to higher

c. The rear CP is often established in built–up areas, adjacent to the brigade MSR. Continuous communications must be maintained with both brigade and subordinate groups or battalions or a combination of these on multichannel, FM–secure, and nets. For continuous operations, S1 and S4 personnel must be cross–trained in report formats and basic functions. An operations situation map must be maintained in the rear CP for logistics planning and backup tactical C^2. The chaplain and the flight surgeon are the other key personnel most often located at the rear CP. However, the HHC commandant often may operate between the rear and main CPs, coordinating TOC support. Therefore, he must operate two communications nets—command and administrative and logistics nets. Figures 2–17 and 2–18 show examples of rear CP formats.
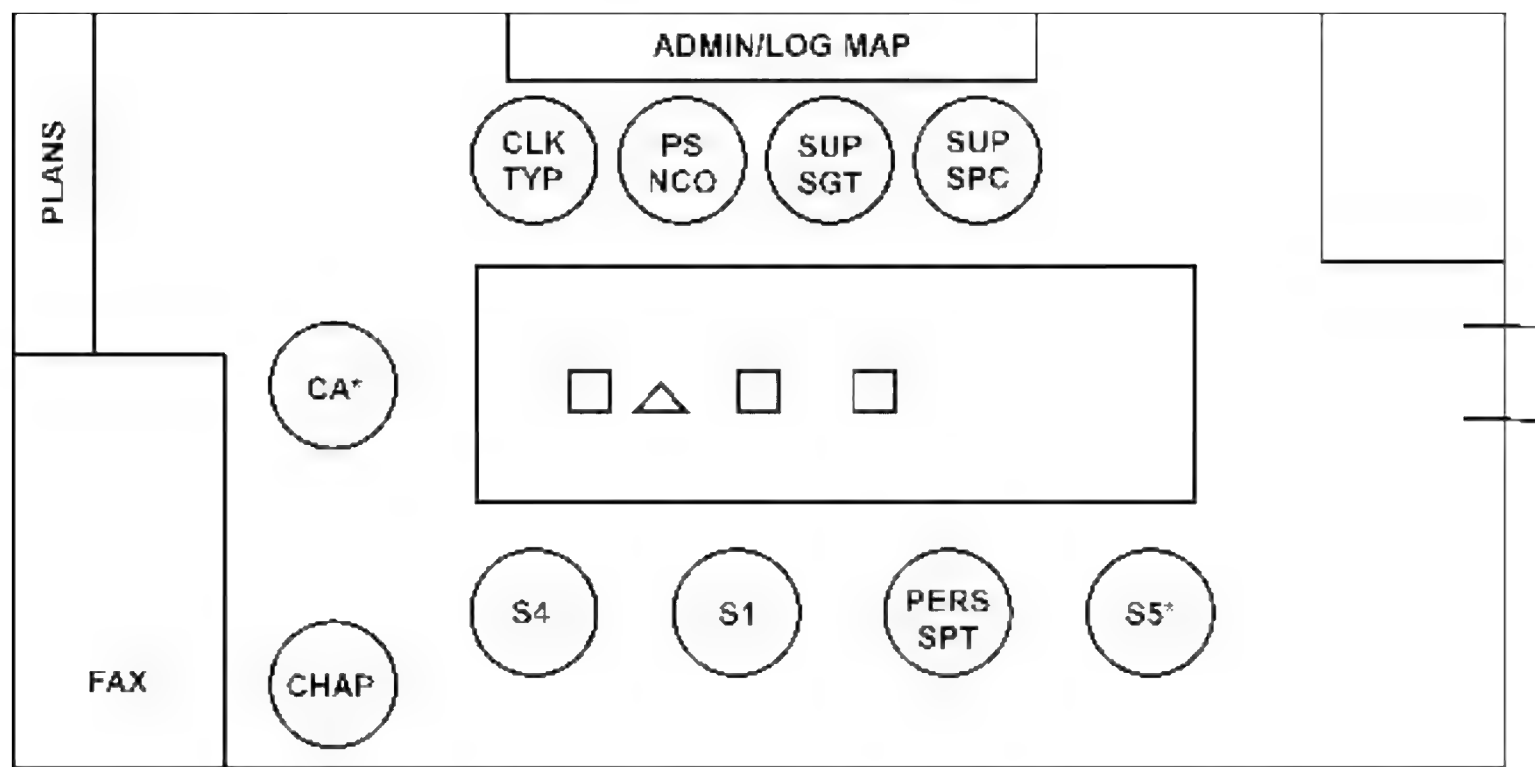
Figure 2–17. Example of a rear CP based on two signal intelligence command post system (SICPS) tents
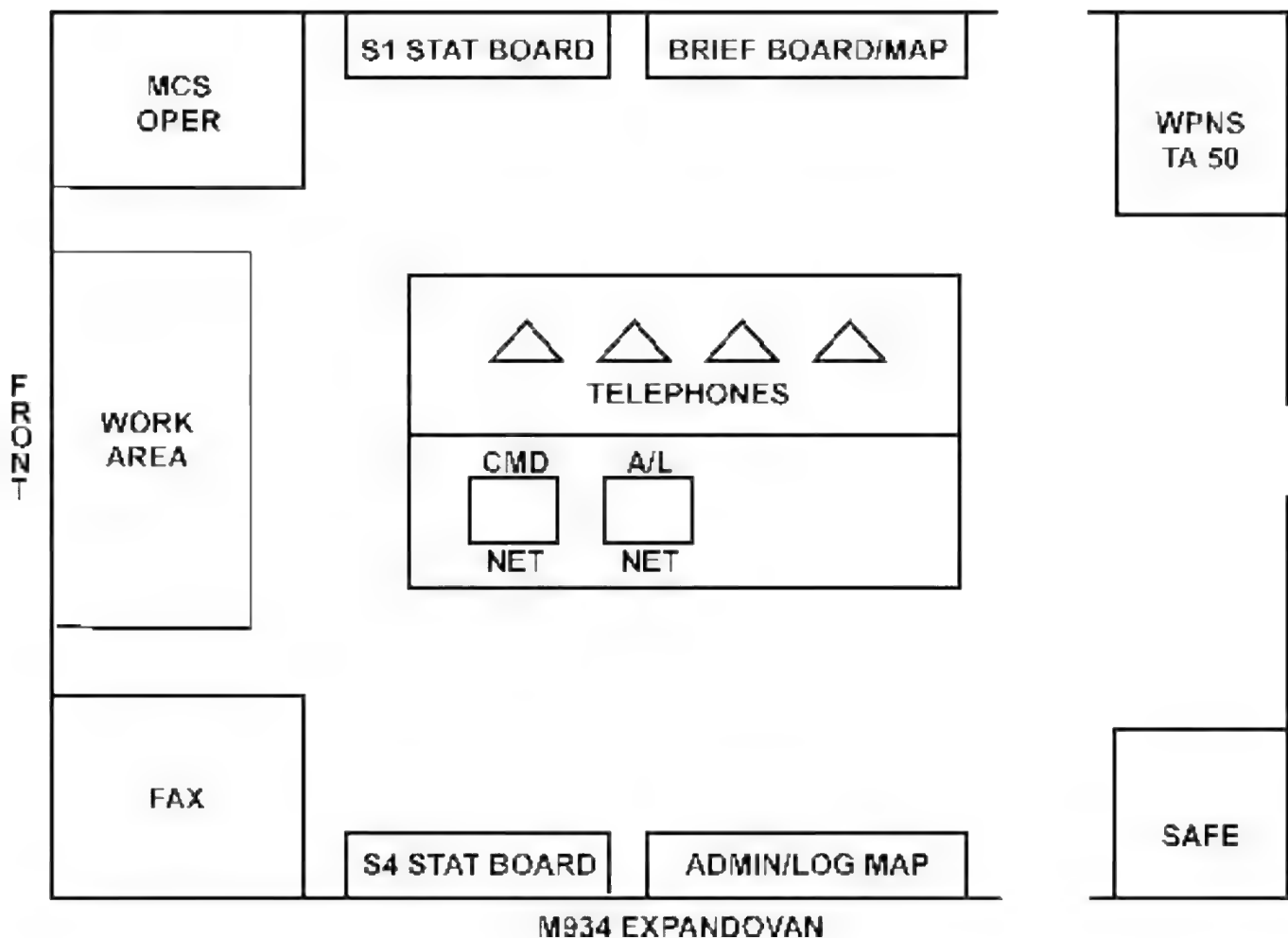
Figure 2–18. Example of a rear CP based on the M934 expandovan

2–8. ALTERNATE TACTICAL OPERATIONS CENTER

If the TOC is destroyed or otherwise rendered ineffective, the brigade must have an alternate facility to assume its functions. The administrative and logistics center, or rear CP, is normally designated as the alternate TOC. Designation of the alternate TOC should be routinely prebriefed. A subordinate group TOC also may serve as the alternate TOC.

2–9. BRIGADE SUPPORT AREA

When a BSA is established, CSS functions within it are a vital part of combat operations. With only organic assets, however, the aviation brigade may not require a BSA. In this situation, the rear CP may be the only element within the AA. However, if subordinate elements of the brigade position their support elements around the rear CP, then the term *BSA* is appropriate. External support assets under OPCON or supporting the brigade also may be configured around the rear CP. Coordination between the administrative and logistics center and the TOC must be continuous to ensure that CSS is integrated into the overall mission. This coordination is accomplished by—

a. Maintaining a radio on the administrative and logistics net with S1 and S4 representatives at the TOC.

b. Establishing a land line between the administrative and logistics center and TOC (if possible).

c. Maintaining a communication net at the administrative and logistics center on the brigade

command net.

SECTION III. COMMAND COMMUNICATIONS SYSTEMS

2–10. COMMAND RESPONSIBILITIES

a. The command transmits and receives information and orders through command communications systems. The commander must understand the capabilities, limitations, and vulnerabilities of his communication systems. Enemy radar, radios, and lasers may operate in the same electromagnetic spectrum as friendly equipment.

b. The commander must expect unintentional interference from friendly units as well as interference from enemy units. Transmissions may also be hindered by terrain, atmospheric conditions, or electromagnetic pulse from nuclear blasts. To compensate for these, the commander should—

(1) Provide for redundancy in the means of communication.

(2) Ensure that subordinates understand his intent so that they will know what to do when communications are interrupted.

(3) Avoid overloading the communication systems by using them only when necessary.

(4) Use wire or messenger when possible instead of radio.

(5) Ensure proper signals security practices are followed.

2–11. SIGNAL SUPPORT

Maintaining communications with higher and subordinate headquarters presents a challenge for the signal officer. Assets available to the brigade are limited, particularly for FM(s) sets. Inevitably, the brigade must rely on a single source to fulfill some communications requirements. The main CP may have to rely more on multichannel for external nets. Besides FM radios on brigade vehicles and aircraft, communications support for the brigade headquarters is provided by two organizations: the signal platoon in the brigade HHC and the supporting signal unit from higher or adjacent headquarters. The signal platoon in the HHC provides FM, AM, HF, and wire communications. The supporting signal unit provides mobile subscriber equipment (MSE) and satellite communications (SATCOM) as required.

2–12. UNIT/STAFF RESPONSIBILITIES

All levels of command and staff must gain and maintain communications with the necessary headquarters and personnel. The traditional communications responsibilities of brigades are covered below.

a. *Higher to Subordinate.* The brigade headquarters must ensure that its radio nets (command, O&I, administrative and logistics, and fire support) are continually operational. The RETRANS system must be dedicated to on–call restoration of communications on any net. Possible RETRANS locations must be identified and checked before starting operations. All key personnel must understand the operation of the RETRANS system.

b. *Subordinate Units.* Subordinate units within the brigade must continually monitor key brigade level radio nets. AT a minimum, subordinate units must monitor the brigade command and O&I nets.

c. *Supporting to Supported.* Liaison elements supporting the brigade must maintain communications between their organization providing the support and the aviation brigade. Thus, a continuous operations capability is maintained. Once located at the tactical CP, main CP, or rear CP,

these units will be controlled by the brigade staff and the headquarters commandant.

d. *Lateral Communications.* Responsibility for establishing communications between adjacent units may be fixed by the next higher commander. If responsibility is not fixed by orders, the commander of the unit on the left is responsible for establishing communications with the unit on the right. The commander of a unit positioned behind another unit establishes communications with the forward unit.

e. *Restoration.* Despite the responsibility, *all* units act promptly to restore lost communications.

2–13. COMMAND COMMUNICATIONS SYSTEMS ARCHITECTURE

a. Army aviation is required to deploy anywhere in the world and operate under most types of environmental conditions. Mission parameters, therefore, require a C^2 system designed to support the commander's needs throughout every phase of the force–projection cycle. The Army has selected battlefield digitization to support the commander's communications requirements.

b. Digitizing the battlefield is the application of technologies to acquire, exchange, and employ timely digital information throughout the battlespace, tailored to the needs of each decider, shooter, and supporter. Digitization allows each soldier to maintain a clear and accurate vision of the common battlespace necessary to support planning and execution. This common picture/situational awareness permits commanders at all echelons to better control forces, synchronize effects, and achieve decisive victory with minimal casualties.

c. Integrated digital system networks (command, control, communications, computers, and intelligence [C^4I] and weapons systems) provide commanders, staffs, sensors, and shooters with a great technological advantage. Information exchange between command communications systems includes, or will include, relative positioning, identification, time, way points, direction, azimuth, targeting, support, coordination, etc.

d. Some of the key command systems providing for aviation brigade internal/external communications linkages are—

    (1) *Combat net radio (CNR).* Aviation brigades will conduct operations over extended distances using CNR as the primary means of communication. CNR is a system of systems. CNR consists of a single channel ground airborne radio system (SINCGARS), a tactical satellite (TACSAT) communications system, and high frequency (HF) radios.

    (2) *Mobile subscriber equipment (MSE).* MSE is a compact mobile communications system providing secure voice, data, and facsimile capabilities. MSE allows the commander to exercise C^2 over forces in a rapidly changing environment. The system is interoperable with CNR, commercial, and North Atlantic Treaty Organization (NATO) standard systems.

    (3) *High frequency nap–of–the–earth communications (HF NOE COMM).* The HF NOE COMM provides the commander with uninterrupted NOE communications over extended distances. This radio is equipped for digital communications, and can adjust input/output to accommodate interference and path loss.

    (4) *HAVEQUICK II.* HAVEQUICK II helps the commander facilitate Army and joint services communication. The system frequency hops to reduce its susceptibility to jamming and interference. The radio can be used for digital target handover and information/intelligence flow between USAF close air support (CAS), OH–58D Kiowa Warrior, and the AH–64D Apache Longbow.

    (5) *Maneuver control system (MCS)PHOENIX.* One element of the Army battle command

system, MCS provides two major functional capabilities; maneuver functional area control (maneuver unit situational awareness) and force level information (critical sustainment information). MCS provides commanders and staffs the capability to collect, coordinate, and act on near–real–time battlefield information. Commanders and staffs can readily access information and display current situation reports that assess enemy strength and movement, as well as the status of friendly forces. MCS then can aid the battle staff in rapidly disseminating the commander's orders.

(6) *Aviation mission planning system (AMPS).* The AMPS provides the commander and staff an automated mission planning and battle synchronization tool. AMPS functions include tactical C^2, mission planning, mission management, and maintenance management. The AMPS provides an interface to the MCS. This provides the aviation commander with continuous updates of the friendly and enemy situation; it allows the commander to rapidly adjust current and future operational plans.

e. Other key elements of the Army BCS that the aviation brigade will have to interface with include:

(1) *All source analysis system (ASAS).* The ASAS provides IPB information used by all echelons for planning combat operations. The ASAS cell is located at the division and corps TOCs. The aviation brigade will interface with it by way of the MCS computer through an area common user system (ACUS) network. During operations, the MCS alone is unable to update the current intelligence picture frequently enough for Army aviation operations. Real–time air threat, ground ADA, and surface–to–air missile (SAM) locations must be passed to aviation TOCs, both ground and airborne within seconds of discovery. The commander's tactical terminal hybrid (CTT–H) system will provide the commander with this near real–time tactical intelligence. It is a receiver processor that extracts intelligence broadcasts from several overhead sources.

(2) *Advanced field artillery tactical data system (AFATDS).* The AFATDS controls all FS operations for the corps and division artillery brigades. The aviation brigade and battalion TOCs nominate targets and submit requests for FS through the MCS computer by way of the ACUS. The fire support element (FSE) at brigade determines which targets will be serviced by assets under brigade control. The rest are submitted to the division, which performs the same filtering process and sends a consolidated list to the corps FSE. During the conduct of tactical operations, the aviation brigade assets coordinate directly by way of SINCGARS and HAVEQUICK radios to fire support teams (FISTs) and forward air controllers (FACs) to place ordnance at the right place and time. These communications are mostly digital, using modems and the message formats of AFATDS or the variable message formats (VMFs).

(3) *Forward area air defense (FAAD).* The FAAD provides an overlay of battery coverage areas to the MCS computer by way of ACUS. The FAAD system accepts feeds from AWACS and organic ground based radars to generate a real–time air picture. The aviation brigade will access this information by way of the Enhanced Position Location Reporting System (EPLARS) over a local area users network. The brigade will pass the critical elements to its aircraft digitally using HF–NOE–COM radios and modems.

(4) *Combat service support control system (CSSCS).* The CSSCS is a computerized system for the control of most classes of supplies, equipment, and personnel replacements. The CSSCS provides information on the status of units and equipment to the MCS computer for transmission to users over the ACUS. The aviation brigade administration and logistics center (ALOC) uses CSSCS software on a common computer to perform its administrative and logistics requests and reporting functions.

2–14. TRANSMISSION LIMITATIONS

a. Because of the aviation brigade's mobility and potential for operating throughout an entire AO, the primary means of communication will be radio. However, *some* radio communications are limited by range and line–of–sight restrictions. In these situations, commanders may lose contact with their aviation units unless radio relays are used. Radio communications should be kept to an absolute minimum until enemy contact is made. Other means to communicate should be used until the radio is necessary so that detection by enemy direction–finding equipment is avoided.

b. Satellite channel availability may be limited for several reasons, especially during early entry operations. Factors such as worldwide geographical location and unit density per satellite ratios may restrict commanders from continuous transnational/over–the–horizon communications.

2–15. BRIGADE RADIO NETS

EAC and division aviation brigade nets—based on the number and types of units assigned in the task organization— are similar to those depicted in these figures. Figures 2–19 through 2–22 show typical corps aviation brigade radio nets.

a. *Command Net.* A secure command net, controlled by the S3, is used for C^2 of the brigade. All assigned units normally operate in this net. As a rule, only commanders, executive officers, or S3s will communicate on the net. *Priority–only* traffic is passed (Figures 2–19 and 2–20).

b. *Operations and Intelligence (O&I) Net.* The brigade S2 controls the O&I net. It functions as a surveillance net when required. Routine operations and intelligence reports are sent on this net (Figure 2–21).

c. *Administrative and Logistics (ADMIN/LOG) Net.* This net is controlled by the S1 and S4. It is used for administrative and logistics traffic within the brigade (Figure 2–22).

d. *Special Radio Nets.* The FSO operates in the supporting FA command fire direction net and in a designated fire direction net to coordinate artillery fires. The USAF ALO, when attached, controls tactical air through a USAF tactical air request net (HF/single side band (SSB)) and a UHF/AM air–ground net.

e. *Fire Control Net.* The fire control net is an FM net operated by the brigade FSO. Fire control coordination measures and information are passed on the fire control net.

f. *Additional Radio Nets*. Besides the internal nets, the brigade monitors the higher command net (FM and AM), the higher operations and intelligence net (FM), and the higher administrative and logistics net (AM). The FSE monitors the supporting artillery battalion command nets (FM) and fire control net (FM and digital).
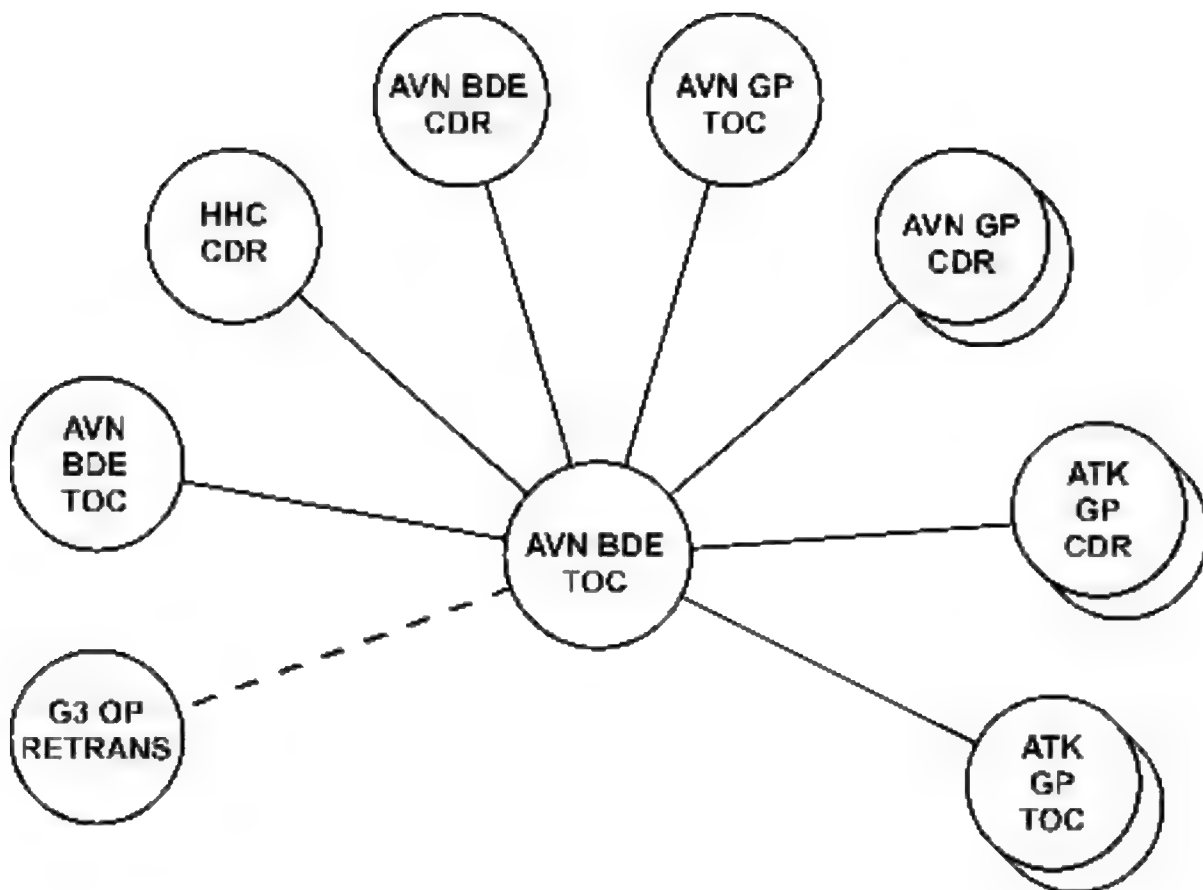
Figure 2–19. Internal command FM net in aviation brigade (corps)
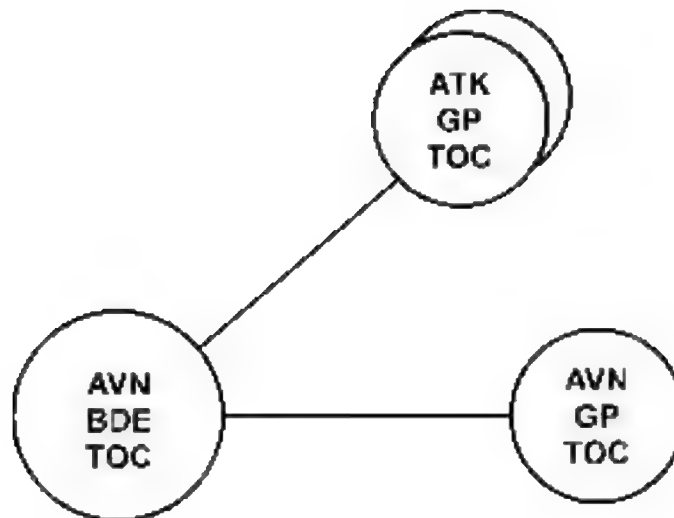
Figure 2–20. Command UHF/AM net in aviation brigade (corps)
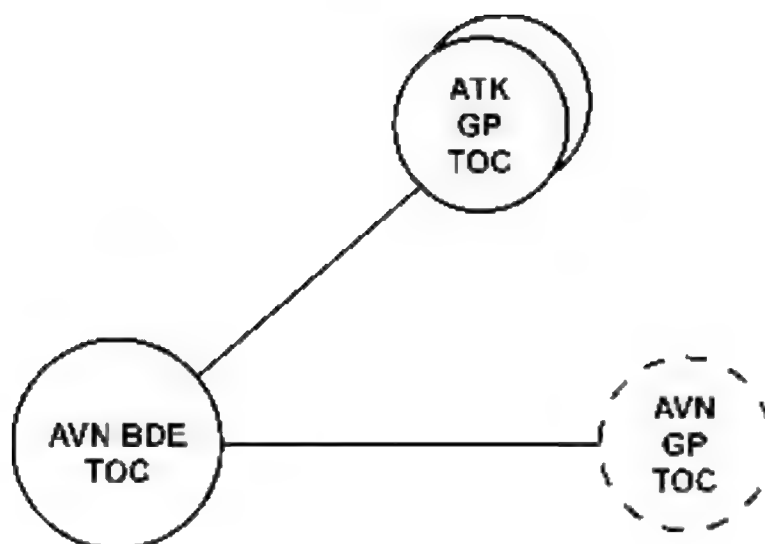
Figure 2–21. Operations and intelligence FM net in aviation brigade (corps)
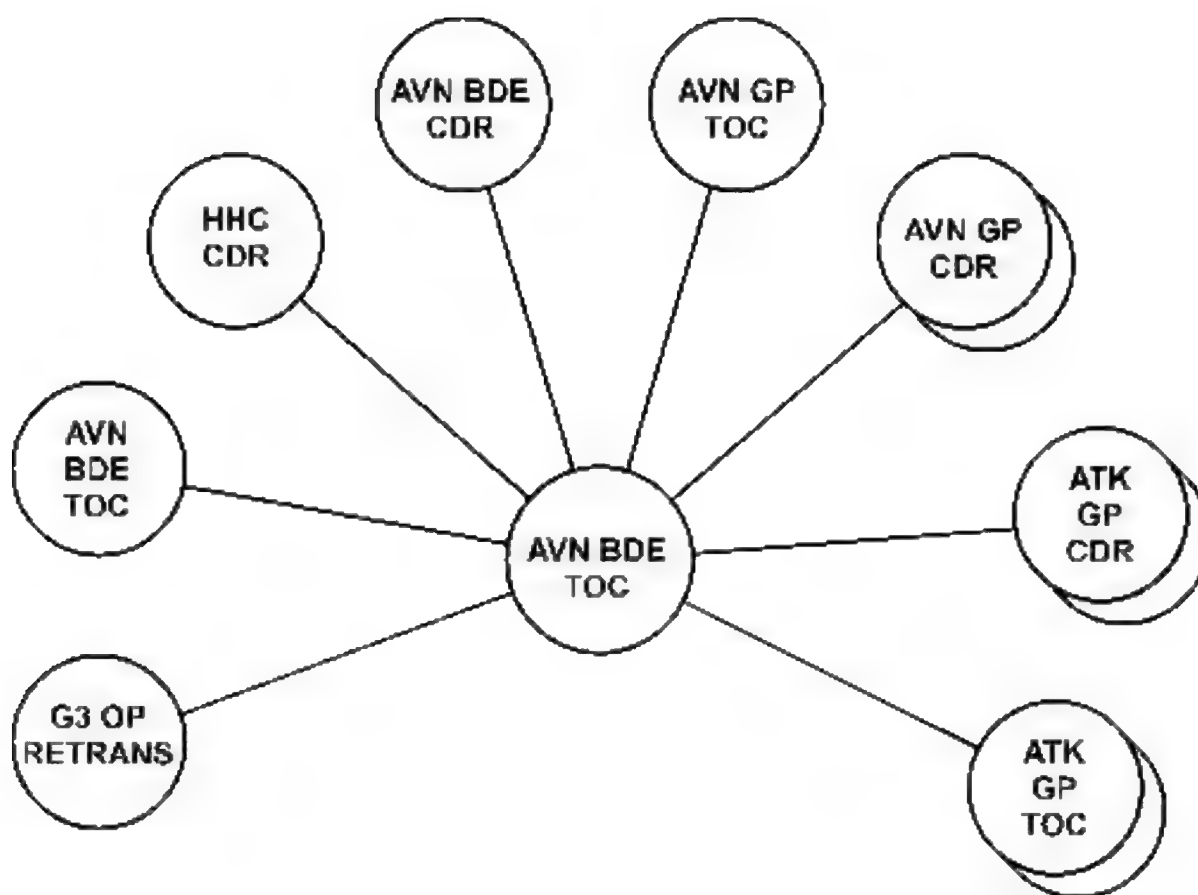
Figure 2–22. Administrative and logistics net in aviation brigade (corps)

2–16. ADDITIONAL COMMUNICATION MEANS

a. *Radio.* The brigade has organic mobile transcriber radio telephone (MSRT)/ digital nonsecure voice terminal (DNVT) means to enter the division ACUS communications network. The forward communications company of the division signal battalion provides MSE terminal (small extension

nodes) to support each brigade. The MSE terminal teams establish a site near each brigade headquarters to terminate ACUS support.

b. _Wire Communications._ When time and distance between units permit, subordinate elements of the brigade are linked with wire.

c. _Messenger Support._

(1) There is no messenger service on a division level and no internal records traffic system. When division messenger service is required, the division signal officer is responsible for determining routes and schedules. Within the aviation brigade, the S3 liaison section—if authorized by TOE—is the only messenger service available. This section can perform a myriad of missions. These missions include—

(a) Delivering/receiving reports.

(b) Obtaining nonroutine distribution.

(c) Collocating with adjacent or higher headquarters to obtain detailed time–sensitive information during a critical period of the battle.

(d) Distributing OPLANs, OPORDs, and FRAGOs.

(2) Messengers will reduce the FM signature and provide better in–depth information during the planning or execution of operations. Normally, one messenger (or messenger team) is dedicated to the higher headquarters while the other (if available) performs duties as required.

d. _Sound and Visual Communications._ Sound and visual signals normally are included in the SOI extract or unit SOP. Signals not included in the SOI may be established by SOP. These signals must be changed often to avoid compromise; yet they must be understood by all. The battlefield has many sounds and signals. For this reason, commanders and staff planners are careful when determining how sound and visual signals will be used and authenticated. Sound and visual signals include lights, flags, hand–and–arm signals, pyrotechnics, and different types of noise such as metal–on–metal sounds, rifle shots, whistles, and bells.

e. _Commercial Communications._ Commercial lines are used only when approved by higher headquarters. Devices such as the KAL 43 may be used to secure commercial communications. If the unit is forced to withdraw, existing wire lines, including commercial lines (if designated by higher headquarters), are cut and sections removed. Thus the enemy will be unable to use them. Once the defensive battle begins, new lines are seldom laid. The unit then relies on radios, messengers, or sound and visual signals.

2–17. LIAISON OPERATIONS

Just as the aviation brigade integrates liaison elements into its scheme of maneuver for those particular assets, the brigade must also provide liaison to other headquarters. When the aviation brigade places a subordinate unit under OPCON—in direct or general support of another headquarters—liaison is established as soon as possible.

a. After communications have been established, face–to–face coordination is essential. This may be achieved initially by the unit commander. The aviation commander must clearly understand the ground force commander's intent and scheme of maneuver so he may best support the operation. Then an LNO or element is collocated with the headquarters.

b. This coordination also allows the aviation commander to synchronize the employment of aviation forces with the scheme of maneuver. Thus, decisive combat power can be concentrated at the proper

time and place. Planning and coordination are critical. The liaison officer plays a vital role in coordination.

c. The LNO should be an experienced combined arms officer/warrant officer. Also, he should be assigned to the aviation unit that will operate with the ground force. The LNO recommends methods of employing aviation forces into the scheme of maneuver to maximize the capabilities of the aviation force. Each LNO also must be aware of his unit's status. He must continuously update the maneuver force commander on the aviation unit's situation. The coordination may also include the exchange of critical information such as call signs, radio frequencies, aviation control measures, and A^2C^2 considerations.

d. Each unit should establish SOPs for LOs Thus, the LNO has a means to first provide the force commander with information and then continually apprise him of the situation. Areas that should be addressed include—

- Unit organization, capabilities, limitations, and status (aircraft, vehicles, personnel).
- Aviation operation employment roles, employment principles, and missions.
- Aircraft capabilities and limitations by type.
- Aviation staff estimate.
- Specific checklists (air assault (aaslt)), deep attack, air movement tables).
- Common equipment weights.
- Safety briefing checklist.
- Class III/V (FARP) operations, capabilities, and limitations.
- Class V configurations.
- Maintenance considerations.
- Crew endurance/fighter management.
- LNO equipment list.

SECTION IV. Command and Control Warfare

Command and control warfare (C^2W) is the integrated use of operations security (OPSEC), psychological operations (PSYOPS), military deception, electronic warfare (EW), and physical destruction—supported by intelligence—to deny information to, influence, degrade, or destroy enemy C^2 capabilities, and to protect friendly C^2 against such actions. JP 3–13.1 provides an excellent overview of this subject. FM 100–6 discusses C^2W as a subset of information operations. The aviation brigade supports these operations in a variety of ways.

2–18. OPERATIONS SECURITY

Operations security (OPSEC) includes all measures taken to deny the enemy information about friendly forces and operations. It involves all security measures that allow units to achieve and maintain surprise. It consists of physical security, information security, signals security (SIGSEC), and deception and countersurveillance activities. Because these categories are interrelated, the aviation brigade commander normally combines more than one technique to counter a threat. Also, the commander can use SIGSEC programs such as EW and signals intelligence (SIGINT). The aviation brigade commander analyzes hostile intelligence efforts and vulnerabilities, executes OPSEC countermeasures, and surveys the effectiveness of

countermeasures. By doing so, he can counter specific hostile intelligence efforts.

a. OPSEC Process. Operations security is the process of denying adversaries information about friendly capabilities and intentions. This process is performed by identifying, controlling, and protecting indicators associated with planning and conducting military operations and other activities.

(1) Security is maintained throughout all phases of an operation. OPSEC is an integral part of planning, unit training, and combat operations at all levels of command. OPSEC denies enemy forces information about planned, ongoing, or post–operational activity until it is too late to react.

(2) Commanders, staffs, and individuals throughout the brigade are responsible for OPSEC. The S3 has primary responsibility for OPSEC within the brigade. He is assisted by the S2, who provides information about enemy collection capabilities.

(3) OPSEC teams with SIGSEC and counterintelligence specialties normally are placed in DS of brigades. These teams help determine OPSEC vulnerabilities, assist in updating enemy intelligence threats, and assess threat vulnerabilities. They report through the intelligence and electronic warfare (IEW) support element collocated with the S2 at theTOC.

(4) OPSEC protective measures are developed by—

(a) Determining the sensitive aspects of the upcoming mission.

(b) Determining enemy capabilities for obtaining information about the operation.

(c) Determining what information obtained by enemy forces can compromise the operation and when they would need it to react.

(d) Determining countermeasures and deception requirements.

(e) Completing an OPSEC estimate (oral or written).

(f) Preparing an OPSEC or a deception plan (oral or written) or both.

b. Application of OPSEC Techniques and Procedures. OPSEC includes the coordinated application of a range of techniques and procedures that deny information to the enemy. Three kinds of actions are taken under OPSEC: *security operations, countermeasures,* and *deception.*

(1) Perform security activities. These security activities include all measures to defeat enemy surveillance by ground, air, or electronic means. At the brigade, these include the components and actions discussed below. SIGSEC protects operational information by employing COMSEC and electronic security techniques. These techniques include the use of—

- Secure voice equipment.
- Approved communication codes and SOI.
- Proper radiotelephone operator procedures.
- Multiplexers to reduce the number of emitters at the CPs.
- Antenna positioning to maximize terrain–masking.
- Low–power or directional antennas when possible.
- Wire or messengers when possible.

(2) Information security. Information security prevents disclosures of operational information through written, verbal, or graphic communication measures. Restrictions placed on personnel and release of operational information include the—

- Development of a comprehensive personnel security program to preclude release of

classified data to those not cleared for such data.

- Limitation of knowledge of plans and orders to only those who have a need to know.
- Proper distribution and accountability of classified data.
- Use of protective coverings on classified correspondence.
- Isolation of units and individuals before operations to preclude spoken disclosures.
- Establishment of classified trash containers and careful destruction of their contents.
- Use of public affairs personnel when dealing with the media.

(3) *Physical security.* Physical security is designed to safeguard personnel and to prevent unauthorized access to equipment facilities, material, and documents as well as to safeguard them against espionage, sabotage, damage, or theft. Techniques used to enhance physical security include—

- Use of security rosters and guards to limit access to CPs.
- Use of approved security containers.
- Use of inventories to account for classified material.
- Detailed preparation of reconnaissance and surveillance plans to include the use of—
  - Patrolling.
  - Observation and listening posts.
  - Ground surveillance radar.
- Platoon early warning systems.
- Anti–intrusion devices such as mines and trip flares.
- Aggressive use of challenges and passwords.
- Use of passive measures including—
  - Concealment of vehicles and facilities through camouflage or by positioning within built–up areas.
  - Enforcement of noise and light discipline.
  - Adherence to stand to procedures.
  - Use of lightweight camouflage nets for aircraft.
  - Establishment of guards and reaction forces for support areas and fixed facilities.
  - Use of MP to patrol rear areas.

(4) *Communications security (COMSEC).* COMSEC involves ***physical***, ***cryptographic***, and ***transmission security.*** COMSEC procedures must be covered in the unit SOP. COMSEC elements and instructions are discussed in paragraphs (a) through (c) below.

(a) *Physical security.* Physical security protects cryptographic systems and classified documents from capture or loss. Before an area is vacated, it is inspected for messages, carbons, cipher tapes, and copies of maps or orders. Wire lines are patrolled to prevent enemy tapping. The loss or capture of codes or cryptographic equipment is reported promptly to the next higher command. The SOP must contain instructions for destroying equipment and classified documents to prevent their capture or use by the enemy. The standing operation instructions (SOI) should not be carried forward of the squadron/battalion TOC; when necessary, the signal officer publishes extracts for forward elements. The unit SOP establishes the priority for issue of SOI and extracts.

(b) *Cryptographic security.* Cryptographic security is maintained by using operation codes, numeral encryption devices, secure voice devices, and other secure

communications equipment.

(c) *Transmission Security.* Transmission security limits the enemy's ability to listen to radio signals. Any signal transmitted can be intercepted and jammed by the enemy. All transmissions should be short and treated as if the enemy were listening. Net discipline is the responsibility of all users, but the TOC is responsible for policing the net. Users should—

- Keep radio transmissions short.
- Send lengthy messages by wire and messengers.
- Use secure means or operational and numerical codes.
- Emphasize the use of SOI, SOPs, and standardized terminology.
- Use low-power transmission and terrain to mask signals from enemy direction-finding equipment.

2–19. COUNTERMEASURES

Countermeasures are taken to eliminate or reduce the success of enemy intelligence collection efforts and early warning of friendly activities. Once a friendly vulnerability is identified and determined to be at risk of detection, a specific counter to the enemy is developed to preclude exploitation. Overcoming one enemy collection effort may be relatively simple. In a multisensor collection environment, however, countermeasure planning must consider all threat capabilities. Countermeasures range from deception to destruction of enemy collection capabilities. Examples of countermeasures against specific threat intelligence operations are as follows:

a. Targeting of enemy reconnaissance, intelligence, surveillance, and target acquisition assets or units for suppression, neutralization, or destruction.

b. Increase of combat patrols to destroy enemy reconnaissance elements.

c. Use of raids to neutralize enemy intelligence targets.

2–20. MILITARY DECEPTION

a. Military deception measures can mislead enemy forces by manipulating, distorting, or falsifying information—causing the forces to act against their interests. Military deception planning is integral to operations planning. For a deception to work, the following conditions must be met:

(1) The deception must be reasonable; operational actions should support planned deceptions.

(2) The enemy must be given adequate time to react to the deception.

(3) Units and activities involved in the deception must appear to be what they depict.

(4) All of the enemy's intelligence–collection capabilities are considered so that each element supports the overall deception.

b. FM 90–2 contains a comprehensive presentation of deception. Deception operations taken to mislead the enemy may include—

- Feints and ruses.
- Demonstrations.
- Use of dummy equipment.
- Falsification of material placed where it can be captured or photographed by the enemy.
- Manipulation of electronic signals.

c. The techniques of deception can be combined in various ways. Military deceptions can be as varied as the imagination of the commander. They have been used by successful commanders throughout history. The commander must always think in terms of security (all types), cover, concealment, and deception as combat multipliers. A small force can simulate a larger one by—

(1) Making the noises of a larger force.

(2) Mixing actual and dummy positions.

(3) Raising dust clouds by dragging chains or tree branches behind vehicles.

(4) Moving a force across an observable area and then returning it under cover and presenting it again and again.

(5) Creating extra radio stations to simulate traffic of a larger unit.

d. Military deception requires good intelligence, OPSEC, and operations planning to be successful. Military intelligence (MI) units provide information about the enemy collection capability and the possible enemy reaction. OPSEC analysis provides indicators, signatures, patterns, and profiles about any friendly unit involved in deception. Operations planners should consider applying deception to all combat operations.

2–21. ELECTRONIC WARFARE

Electronic warfare (EW) has three subelements: ***electronic attack***, ***electronic protection,*** and ***EW support***. The SIGSEC and COMSEC sections addressed electronic protection.

a. Electronic attack involves the jamming of his critical command and control assets. All division aviation brigades have organic EH–60 aircraft in their command aviation battalion (CAB), general support aviation battalion (GSAB), or assault battalion capable of executing this mission. Corps and theater aviation brigades would require external assets to execute this mission.

b. EW support involves giving the commander critical electronic intelligence (ELINT). The brigade's EW aircraft intercept enemy transmissions and provide the location of his transmitters. Once the commander knows their location, he can target them for either destruction, jamming, or exploitation.

2–22. PHYSICAL DESTRUCTION

Physical destruction of an enemy C^2 asset can be executed by corps and division aviation or a theater aviation brigade when augmented with attack aircraft. Aviation brigades also can assist other Army and joint assets performing this mission through direction finding and target designation.

2–23. PSYCHOLOGICAL OPERATIONS

a. Psychological operations (PSYOP) is defined as planned operations to convey selected information and indicators to foreign audiences to influence their emotions, motives, objective reasoning. Ultimately, PSYOPS influences the behavior of foreign governments, organizations, groups, and individuals. The purpose of PSYOPS is to induce or reinforce foreign attitudes and behavior favorable to the originator's objectives. (JP 1–02)

b. Military operations have some psychological impact on the enemy. The aviation brigade can fly missions whose intent is purely psychological (i.e. dropping leaflets) or missions whose intent is purely tactical but produces residual psychological effects. An example of this would be an attack batallion that destroys a logistics base 100 km behind the FLOT. The psychological effect on the enemy force in contact could be as devastating as any direct fire engagement.

Chapter 3

EMPLOYMENT

This chapter covers aviation operation principles, planning considerations, task organization, and employment principles and roles of the aviation brigade. It is a foundation for commanders and their staffs to use in employing their aviation units at all echelons in close, deep, and rear operations.

SECTION I. Aviation Operation Principles

3-1. GENERAL PRINCIPLES

a. Aviation provides the essence of a versatile force whose primary focus is combat operations. General principles that apply and go beyond or derive from the principles of war and the tenets of Army operations (chapter 1) drive mission and execution. FM 1-100 describes aviation operation principles in detail.

b. Army aviation operation principles are as follows:

(1) Aviation operates in the ground regime.

(2) Aviation expands the battlefield in space and time at each echelon.

(3) Aviation performs combat, combat support (CS), and combat service support (CSS) battlefield functions.

(4) The role of combat aviation is to locate, report and/or destroy enemy ground forces and support elements.

(5) Aviation is concentrated at division and corps level.

(6) Aviation units are integrated into the combined arms down to the level at which they will be employed.

(7) Planning times for aviation and ground maneuver elements will be the same.

3-2. APPLYING OPERATIONAL PRINCIPLES

a. The general principles listed above drive Army aviation mission planning for - and execution of - combat operations. By providing guidance beyond the principles of war and the tenets of Army operations, they establish the broad doctrinal focus of Army aviation operations.

b. For example, when applying these principles, aviation commanders -

(1) Define aviation's role as an essential member of the combined arms team.

(2) Integrate Army aviation into all strategic, operational, and tactical operations to achieve success.

(3) Enable Army aviation to retain tactical maneuver advantage over the enemy.

(4) Shape the battlespace with aerial and ground maneuver forces during combined arms, joint, combined, special, and contingency operations.

<div align="center">

SECTION II. Planning Considerations

</div>

3-3. PLANNING AVIATION OPERATIONS

a. The focus of Army aviation must enhance ground-paced maneuver and exploit maneuver. Army aviation has the capability to place the enemy in a position of disadvantage through the flexible application of combat power in the third dimension. Thus, aviation accelerates the tempo of combat operations while remaining an integral part of the combined arms team. During offensive and defensive operations, the aviation brigade is employed offensively to retain the initiative and offensive spirit critical to successful operations in close, deep, and rear areas.

b. In planning aviation operations, the brigade commander and his staff must consider several factors. The two primary factors are the higher commander's intent and mission, enemy, terrain, troops, and time available (METT-T). After the analysis is completed, a concept of operation is developed. Then orders are issued for execution by subordinate elements. Other considerations include risk analysis and CSS.

3-4. HIGHER COMMANDER'S INTENT

Unit commanders must understand how their actions complement the overall plan. Army aviation operations doctrine emphasizes exploiting the initiative at every level of command; however, all initiatives must follow the intent of the next higher command. Misinterpretations can lead to counterproductive actions and potentially disastrous results. The higher commander's plans for conducting the battle dictates the employment of the aviation brigade. Therefore, the brigade commander not only must be cognizant of the mission but he must also appreciate the ultimate objective of higher echelon actions. The commander ensures that his intent is clearly understood. He also establishes guidelines for reacting to contingencies that may develop during the operation. Such planning promotes initiative.

3-5. MISSION, ENEMY, TERRAIN, TROOPS, AND TIME AVAILABLE

The brigade commander and his staff must fully analyze the factors of METT-T and understand its many areas.

a. *Mission.* The specified task or mission issued to the aviation brigade must be fully understood. The brigade commander-and his staff-must determine whether the commander's units can fulfill the mission as prescribed. If not, the commander must convey to higher headquarters what augmentation or support he needs to accomplish the mission.

b. *Enemy.* Commanders must know enemy doctrine, tactics, forces, and objectives; assess enemy capabilities and intentions; exploit enemy weaknesses; and focus intelligence assets. All information available about the enemy should be obtained through a detailed brigade S2 intelligence preparation of the battlefield (IPB). This information must be continuously updated and thoroughly disseminated. The IPB is one of the most important aspects of planning. FM 34-130 discusses IPB in detail.

c. *Terrain.* The terrain is as important as the mission and enemy. Many details about the

terrain can be obtained through IPB. However, several other factors should also be considered. These include environmental conditions of the aviation brigade's area of operations (AO), the weather, and surface conditions that may affect both friendly and enemy operations.

d. *Troops.* Troops available include those units assigned to the aviation brigade as well as other forces that may be task-organized with the brigade. Aviation brigades can also accept operational control (OPCON) of other aviation forces. Section III covers task organization in more detail.

e. *Time Available.* Time is also a critical consideration. Time may include time of execution as well as time for preparation of a particular operation or mission. Ideally, planning at higher headquarters consumes one-third of the time allocated; subordinate units should be allowed two-thirds of the time for their planning and preparation.

SECTION III. Task Organization

3-6. TASK-ORGANIZING

a. *Aviation Brigade Pure.* Aviation brigades may be employed as an aviation brigade pure force. As a pure force, aviation brigades offer the force commander the agility and flexibility to create windows of opportunity and to strike aggressively and decisively against threat operational and tactical centers of gravity. Speed, range, and mobility are inherent in an aviation-pure organization.

b. *Combined Arms.* Aviation brigades may be task-organized with other maneuver forces or be the controlling headquarters for a combined arms force. The combined arms organization provides force commanders the unique capability to accelerate the tempo of ground maneuver operations while employing ground and air maneuver to keep the enemy off balance. Appendix F covers combined arms operations in detail.

c. *Force Protection.* Pure aviation brigades are minimally manned to provide force protection. When attached, external force protection support personnel must be ready to provide ground security around and throughout the brigade assembly areas (AAs). Force protection packages vary according to the mission, operating environment, and sizes and locations of the AA(s).

3-7. SYNCHRONIZING AVIATION BRIGADE ASSETS

a. Synchronization is the arrangement of battlefield activities to produce maximum relative combat power at the decisive point. Synchronization relies on the complementary and reinforcing effects of combined arms and services. It requires a unity of purpose that fuses close, deep, and rear operations. Synchronization also depends on the mastery of time-space relationships as well as knowledge of enemy and friendly capabilities. Careful and complete planning and coordination are extremely important for integrating the combat power of aviation forces with other combined arms assets. The goal of synchronization is to use every asset where, when, and in the manner in which it contributes most to superiority at the point of decision.

b. Forces in combined arms operations complement each other's objectives. Aviation and ground forces do not always attack along the same axis or have identical objectives. The key is to plan operations that synchronize combat power to constantly pressure the enemy.

c. Aviation brigades are integrated into the scheme of maneuver through liaison operations (LOs). Also, aviation unit commanders coordinate face-to-face with ground commanders as described in paragraph 2-17 (Liaison Operations).

3-8. COMMAND AND SUPPORT RELATIONSHIPS

Aviation brigades and subordinate units may operate with other maneuver, CS, or CSS elements during all operations. These assets may be employed in either a command or support relationship, depending on METT-T and the overall scheme of maneuver.

a. *Command Relationships.* Command relationships are assigned, attached, under OPCON, or under tactical control (TACON). Aviation forces operating in the maneuver role may be placed under OPCON or TACON of another maneuver headquarters (normally brigade and higher) for a specific mission or period of time. Aviation forces also may conduct CS and CSS operations under OPCON; however, they usually operate in a support relationship.

b. *Support Relationships.* Joint Publication JP 0-2 states that-when a superior commander decides that one force should aid, assist, protect, or sustain another force-a support relationship will be established between the forces. Direct support (DS), general support (GS), and mutual support (defined below) are the only support relationships that apply to Army aviation operations. For example, assault helicopter and medium helicopter units may perform air movement operations or command aviation assets may enhance command, control, communications, and intelligence (C^3I) operations.

> **(1)** *Mutual Support:* Mutual support is the support that units render each other against an enemy because of their assigned tasks, their position relative to each other and to the enemy, and their inherent capabilities. JP 1-02)
>
> **(2)** *General Support:* General support is the support that is given to the supported force as a whole and not to any particular subdivision thereof. (JP 1-02)
>
> **(3)** *Direct Support:* Direct support is the support provided by a unit or formation not attached or under the command of the supported unit or formation, but required to give priority to the support required by that unit or formation. JP 1-02)

SECTION IV. Employment Principles

3-9. AVIATION BRIGADE CONTRIBUTIONS

Aviation brigades contribute at the strategic, operational, and tactical levels of warfare. Integration of Army aviation into all strategic, operational, and tactical operations is a decisive factor in achieving overall success during modern combat. Force commanders shape the battle with aerial and ground maneuver forces during combined arms, joint, and combined operations-as well as contingency operations-across the spectrum of conflict. Army aviation operations-whether enhancing

ground-paced maneuver or accelerating the tempo of operations-enable force commanders to retain tactical maneuver advantage over the enemy.

3-10. EMPLOYMENT OF AVIATION ASSETS

a. The employment of aviation units differs little from that of typical ground maneuver forces. The principles below are guidelines for the employment of aviation assets operating on the modern battlefield. These principles are further described as they pertain to aviation brigades.

(1) *Fight as an integral part of the combined arms team.* Integration of aviation employment is key to the overall scheme of maneuver. Aviation brigade assets are optimized when integrated into the ground tactical plan. Aviation brigades can conduct independent or pure aviation brigade operations; however, they are normally a member of the combined arms team. Aviation brigades require augmentation to conduct independent operations for extended periods. Whether pure or task-organized, they increase the tempo of operations. When employed as a member of the combined arms team, aviation brigades also help ensure that the enemy has to fight in more than one direction.

(2) *Exploit the capabilities of other branches and services.* During all operations, aviation brigade assets rely on other branches or services or both. The aviation brigade at any echelon must be employed with other branches to offset its own vulnerabilities; thus, it must exploit the strengths of other branches and services. For example, during a maneuver operation, ground units expose the enemy. Then aviation forces-including combat, CS and CSS-exploit the enemy's weaknesses. These assets must be fully exercised to obtain their maximum potential.

(3) *Capitalize on intelligence-gathering capabilities.* Aviation brigades provide the force commander with enormous intelligence-gathering capabilities. Thus, the commander must focus on his intelligence-gathering assets and integrate or capitalize on the capabilities of all assets available for mutual support.

(4) *Suppress enemy weapons and acquisition means.* Enemy air defense (AD) weapons and acquisition systems may be defeated actively or passively. The aviation brigade commander must accomplish one or both of these tasks. Passive means include terrain flight techniques, employment of aviation survivability equipment (ASE), and avoidance. Active measures include direct or indirect weapons employment against a particular target. Aviation brigade elements may perform this mission in a mutually supporting role or depend on other branches or services for this function. During the planning and execution of an operation, aviation brigades must use assets such as attack aircraft, field artillery (FA), intelligence and electronic warfare (IEW) support forces, US Air Force (USAF), US Navy (USN), and US Marine Corps (USMC) assets or a combination of these.

(5) *Exploit firepower.* Aviation brigades allow the force commander to exploit firepower in several ways. Attack helicopter units provide direct fires during offensive and defensive operations. Aviation units-particularly target acquisition companies and platoons-observe and adjust indirect fires. Assault and medium helicopter units position and resupply AD, antitank, and FA units across the battlefield. The aviation brigade lends depth to the force, as in defensive operations when they may be employed to

cover the deployment of ground maneuver forces. They also are well suited to attack trailing enemy formations.

(6) *Exploit mobility.* Aviation brigades allow the force commander to position fire and maneuver assets rapidly anywhere on the battlefield. These forces quickly position themselves at critical points to counterattack enemy penetrations, exploit and pursue enemy retrograde actions, or influence enemy actions deep in enemy rear areas. Also, aviation brigades conduct air assault and air movement as a part of the overall scheme of maneuver to provide mobility for the force commander.

(7) *Exploit surprise*. With their increased firepower and mobility, aviation brigades can exploit surprise when and where the enemy least expects it. Aviation forces may be employed day or night-and in some adverse weather conditions-to enhance the element of surprise. Planning, however, remains critical to the success of the unit.

(8) *Mass forces.* Mobility plays a vital role in massing forces. Aviation brigade assets can be rapidly positioned and repositioned at critical points on the battlefield. Combat power is refocused relentlessly anywhere on the battlefield to exploit the enemy's weaknesses.

(9) *Use terrain for survivability.* Although aviation brigade maneuver, CS, and CSS units are not restricted by terrain, they are-in a sense-bound by terrain for survivability. Aviation forces also must use terrain for cover and concealment as their ground counterparts. Army airspace command and control (A^2C^2) is a necessary element; it ensures that a force commander's "airspace" is not violated and that personnel and equipment are not lost needlessly.

(10) *Displace forward elements frequently.* Aviation brigades typically are not displaced well forward as an entire unit. Elements of the brigade may be employed for a specific mission or period of time based on METT-T.

(11) *Maintain flexibility.* Aviation brigades greatly enhance a force commander's flexibility. While the focus may be on close or deep operations, aviation brigade assets may be tasked to perform rear operations at the same time or as a separate action. Flexibility provided by aviation brigades allows the commander to combine the firepower and mobility employed with surprise and the massing of troops to conduct combined arms and joint operations.

(12) *Exercise staying power.* If planned in detail and coordinated properly, aviation brigade assets may be employed for a sustained period of time or for a specific operation. Aviation forces greatly enhance the commander's staying power. However, they must be augmented by CS and CSS to increase their staying power. Through integration of CS and CSS assets with aviation and other maneuver forces; these assets are available for future operations, as well as for present operations.

b. The guidelines for Army aviation employment are a collection of flexible, common sense ideas. They are not to be rigidly applied; these ideas, instead, must be carefully tailored to each situation. Certain situations may require emphasis on one or more of the principles. Leaders must weigh the operational payoff against the inherent risk.

SECTION V. Employment Roles

3-11. MAJOR ROLES AND FUNCTIONS

a. Aviation brigades provide the force commander with the capability to conduct missions across the range of military operations. This section focuses on those missions the aviation brigade is required to execute. It describes the major employment roles and other battlefield functions related to the employment principles of aviation brigades. These roles and principles complement the participation of aviation brigades in combined arms, joint, combined, and special operations. The employment roles for aviation brigade operations include combat, CS, and CSS. Normally, in the CS and CSS roles, aviation brigades are force providers.

b. Knowledge of the threat, IPB, and METT-T are the keys to balancing aviation's employment principles properly. Thus, the commander can achieve success on the modern battlefield.

3-12. COMBAT OPERATIONS

During combat operations, aviation brigades conduct attack, reconnaissance, security, air assault, and special operations (SO), and exercise command and control (C^2).

a. *Attack.* Attack helicopter operations normally are offensive in nature; however, they may be conducted during offensive or defensive operations. Attack helicopter battalions (ATKHBs) operate in the close, deep, and rear environments. Attack helicopter capabilities include antiarmor, antipersonnel, suppression of enemy air defense (SEAD), joint air attack team (JAAT), limited air combat, and the destruction of enemy facilities and materiel. Attack helicopter missions include raids, exploitations, pursuits, deceptions, counterattacks, spoiling attacks, reconnaissance, and security. Attack helicopter operations can cause the enemy to divert combat forces and force the untimely commitment of follow-on forces. The intent behind all attack operations is to hinder the threat's current and future operations. Essential elements for attack operations include friendly and enemy situational awareness, an extensive SEAD effort; command, control, communications, and countermeasures (C^3CM); and well-planned and supportable CSS.

b. *Reconnaissance.* Reconnaissance operations obtain information by visual observation or electronic detection methods. This information may concern the activities and resources of an actual/potential enemy, or the meteorologic, hydrographic, and/or geographic characteristics of a particular area. The division cavalry and air reconnaissance squadrons conduct this mission as part of the aviation brigade or are employed directly by the division commander. The cavalry and air reconnaissance squadrons conduct zone, area, and route reconnaissance as well as force-oriented and reconnaissance-in-force operations. Although not their primary mission, ATKHBs also can perform reconnaissance. FM 1-112 and FM 17-95 provide detailed procedures for reconnaissance operations.

c. *Security.* Security forces provide reaction time, maneuver space, and protection for the main body. Security operations include screen, guard, cover, and rear area security missions. Although not a formal type of security operation, air assault security also is a critical mission performed by attack helicopters.

(1) *Screening force operations.* Screening operations are conducted within supporting

indirect fires from the main body. The cavalry squadron normally conducts screening operations for the division commander or in support of a ground brigade. FM 17-95 discusses screen operations in detail. An overview of screen missions includes:

(a) Maintaining surveillance.

(b) Providing early warning to the main body.

(c) Impeding and harassing the enemy with supporting fires.

(d) Performing counterreconnaissance by destroying enemy reconnaissance elements.

(2) *Guard force operations.* Guard operations are conducted within supporting indirect fires from the main body, and accomplish all the tasks of a screening force. In addition, a guard force prevents enemy ground observation of, and direct fire against, the main body. A guard force may reconnoiter, conduct target acquisition and engagement, attack, defend, and delay to accomplish its mission. FM 17-95 discusses guard operations in detail.

(3) *Covering force operations.*

(a) A covering force accomplishes all the tasks of screening and guard forces. However, a covering force may operate outside the range of the main body's indirect fires and is a tactically self-contained force.

(b) Armored cavalry regiments (ACRs) normally conduct covering force operations for the corps. If the corps has an ACR, the corps aviation brigade may be required to augment it. If the corps has no ACR, the aviation brigade may be tasked as the covering force headquarters. In this situation, the aviation brigade commander can expect to be augmented with additional ground maneuver forces, CS, and CSS. He also should be relieved of deep and rear operational requirements when conducting operations as a covering force.

(c) A division covering force probably will be a brigade-size task force (TF). If the division aviation brigade is tasked to be the covering force headquarters, the brigade commander can expect to be augmented with ground maneuver forces and additional CS and CSS. If the aviation brigade is not tasked to be the covering force headquarters, the aviation brigade commander can expect to support the covering force operation with aviation brigade assets. FM 17-95 discusses covering force operations in detail.

d. *Air Assault.* Aircraft are vulnerable during movement, insertion, and extraction operations; therefore, they require support from combined arms resources. Attack helicopter units and FA normally are integrated into the movement, insertion, extraction, and ground tactical plans to provide security and to weight combat power. Terrain flight techniques mask unit movements, thus enhancing survivability and deception. While air assault operations are tied directly to the ground tactical plan, coordination time normally is short. These operations are enhanced when pathfinders or personnel trained in air assault coordinate landing zone (LZ) and pickup zone (PZ) activities. Comprehensive standing operating procedures (SOPs) and habitual training relationships also make these operations more effective. Assault helicopter battalions

(AHBs) deliver forces directly into close, deep, and rear combat operations. Air assault forces-

(1) Seize and retain key terrain.

(2) Engage and destroy rear area threats.

(3) Attack and/or counterattack during close and deep operations.

(4) Conduct raids and deception operations.

(5) Block or contain enemy forces.

e. *Special Operations (SO).* Aviation brigades may be employed in roles critical to the success of SO. They also may operate with, augment, or participate in SO. Aviation brigades may have to provide aviation support to special operation forces (SOF)-conducting unconventional warfare, direct action, special reconnaissance, antiterrorism, and other SO activities. FM 1-108 and Appendix K of this manual describe SO missions and operations.

f. *Theater Missile Defense(TMD).*

(1) TMD is a joint mission with four primary pillars: ***active defense***; ***passive defense***; ***attack operations***; and ***command*, *control*, *communications*, *computers*,** *and* ***intelligence (C^{4}I)***. The aviation brigade's primary contribution comes in the area of attack operations. The aviation brigade can execute this mission using either of two methods, depending on the ***conditions*** with which it is confronted. If the enemy's precise location is known, the mission can be planned and executed like a standard deliberate attack. The more likely method is search and attack. This method is used when the targets are moving or only an approximate location is known. The aviation brigade uses its available intelligence and the speed of movement of the TMD to establish a search area. When available, unmanned aerial vehicles (UAVs) can precede the unit into the area to aid in the search. Ingress and egress to and from the search area are executed like any other deep mission; however, the technique used for the search of the area itself is based on METT-T. The airspace requirements for this mission are extensive until complete situational awareness is available to all joint players. The risks also are very high compared to the assets executing the mission; however, only the aviation brigade can find and kill these targets without a precise location provided by another sensor. A possible extension of both methods-mentioned in FM 100-12-is a divert mission at the discretion of the appropriate commander. This means that an attack unit would have some or all of it's assets diverted to attack a TMD target during the conduct of another mission. This mission is high risk one even when attempted with the presence of the following imperatives:

(a) *Notification and planning.* Notification comes in the form of a "be prepared" or "on order" mission to the commander from his higher headquarters to execute TMD operations. This notice allows the unit to develop routes, supporting SEAD packages, and control measures to execute the mission.

(b) *Communications.* A clear over-the-horizon communications link between the aviation brigade/battalion and the air mission commander of the attack helicopter force conducting the deep attack is required. Through this communications link, the mission change order is given and all pertinent supporting information passes.

Digital connectivity between the aviation unit to both the intelligence and FS structures also is required. These links give the executing unit the truth about the enemy's ground situation at the new objective area as well as during the ingress and egress phases. They also help protect the executing aviation unit from fratricide without taking those critical long-range shooters out of the fight.

(c) *Training.* For TMD training to take place, the unit must haveTMD included in the unit mission essential task list (METL), which allocates time and resources for training in TMD.

(2) FM 100-1 contains a more detailed discussion of general TMD operations. Specific tactics, techniques, and procedures (TTP) for TMD attack helicopter operations can be found in FM 1-112. JP 3-01.5 describes joint TMD.

g. *Support by Fire.* In the support by fire role, the aviation brigade directs attack helicopters into an overwatch position to establish a base of fire. This action allows other maneuver assets to move to, or around, the target area or engaged enemy force. The intent of this action can range from suppression to destruction of the enemy force, but the primary mission is to fix the enemy force so another friendly force can maneuver.

3-13. COMBAT SUPPORT OPERATIONS

Aviation combat support is the operational assistance that aviation assets provide to combat elements. During CS operations, aviation brigades enhance command, control, communications, and intelligence (C^3I); and conduct air movement, aerial mine warfare, combat search and rescue (CSAR) operations; electronic warfare (EW); and air traffic services (ATS). In the CS role, the aviation brigade also performs close air support (CAS). These operations are addressed below.

a. *C^3I Enhancement.* Maintaining C^3 is critical to any operation. The continuous flow of intelligence also is vital. Operating at long ranges and against enemy EW hinders C^3I.

(1) Aviation brigades can quickly provide reconnaissance, surveillance, and security of friendly lines of communication. These lines also include future locations. Brigade assets also may have to maintain surveillance of the area or provide security while an area is being established. Brigade assets may deliver messages and documents that cannot be electronically transmitted in a nuclear, biological, chemical (NBC) or a jamming environment. Brigade elements have this mission most often when radio listening silence is imposed or equipment has become inoperable. Messages may include combat plans and orders, written coordination and control measures, and graphics. Documents delivered are critical reports essential for sustaining combat operations. These lines include-

- Roads.
- Air and ground supply routes.
- Relay and retransmission sites.
- Critical signal nodes.
- Microwave facilities.
- Telephone wire structures and systems.
- Air and sea points of debarkation.

● Supply and maintenance centers

(2) Brigade elements may provide communications enhancement through airborne retransmission or transport retransmission/relay equipment. They also may expedite movement of one or more command posts (CPs). Brigade assets permit commanders to see their AO easily. Thus, commanders can better control their units. Other brigade tasks may include liaison between units required to transmit intelligence and to verify the unit situation and location. Other intelligence functions include target acquisition, reconnaissance, and employment of intelligence-gathering systems. All heliborne platforms can contribute to these type operations.

b. *Air Movement.* In air movement operations, aviation brigade assets sustain air and ground maneuver units during close, deep, and rear operations. Air movement operations deliver troops, supplies, and equipment while remaining clear of enemy engagements. Assault and medium helicopter units are employed with their aircraft in both internal and external load configurations. Aviation brigade units emplace and reposition critical combat units, equipment, and supplies for current and/or future maneuver operations.

c. *Aerial Mine Warfare.* Aviation brigades conduct aerial mine warfare as a large-scale operation. This operation is part of the overall engineer plan. The entire brigade may be employed with attack or reconnaissance units to secure the operation. At the same time, utility helicopter assets rapidly deliver mines, aerially, to a designated area as prescribed in the plan. The Volcano system gives the aviation brigade the capability to emplace large minefields rapidly. This operation may be conducted in the countermobility role to inhibit the enemy's movement either in an offensive operation or a retrograde operation to prevent the enemy from withdrawing. This operation promotes friendly offensive operations, particularly while friendly elements are in pursuit. Aerial mine warfare also may assist in friendly mobility operations. Emplacing mines into blocking positions inhibits the threat from hindering friendly movement. FM 1-113 contains detailed information on employment of Volcano minefields.

d. *Combat Search and Rescue (CSAR).* Aviation units normally conduct CSAR operations to recover friendly isolated personnel. These operations may include locating and extracting friendly ground elements that have been cut off or left behind. This mission is not to be confused with medical evacuation (MEDEVAC). Appendix D discusses in CSAR operations in detail.

e. *Air Traffic Services.* ATS units support A^2C^2 systems as a subordinate element of A^2C^2. ATS liaison personnel-along with other staff representatives-are located within the division, corps, and theater A^2C^2 elements. They provide functional area (technical) expertise in the operation of the A^2C^2 system. ATS integration elements at the division and corps airspace information centers (AICs) use organic communications and navigational systems to update air operations information. The information pertains to friendly, unknown, and hostile aircraft and the overall A^2C^2 situation. ATS elements may provide the main communications link to support Army aviation and ground maneuver unit requirements; for example, to establish and control forward arming and refueling points (FARPs), PZs and LZs-and temporary airdrop or air-land areas-and for joint or multinational forces. ATS units provide a range of tactical support during deep, close, and rear operations. This support may include various services required by Army, service component, and allied aircraft. Some of these services are-

● Airspace deconfliction during current operations.

- Navigational assistance.
- Flight following.
- Air threat warnings.
- Weather information.
- Artillery advisories.
- En route navigational structures.
- Landing area terminal control.

f. ***Intelligence and Electronic Warfare.*** In the IEW role, aviation brigade cavalry and reconnaissance units gather intelligence and perform counterintelligence and counter-counterintelligence. They perform these missions by seeing the enemy and destroying his assets that can see our forces. These assets monitor and report enemy activity. The division aviation brigade's organic EH-60 Black Hawk aircraft also provide some IEW capabilities through communications interception, jamming, and direction finding.

3-14. COMBAT SERVICE SUPPORT OPERATIONS

Aviation CSS is the assistance that sustains combat forces using aviation assets. During CSS operations, aviation brigades conduct aviation maintenance and aerial transport operations. They primarily emplace and reposition logistical support: equipment, materiel, and supplies. These operations also may include the movement of personnel.

a. ***Sustainment.*** Sustainment is the movement of equipment, materiel, supplies, and personnel by utility/cargo and fixed-wing assets for operations other than air assault and combat support. Missions include intratheater airlift; administrative relocation of troops and nonmilitary personnel; and administrative relocation of equipment, materiel ,and supplies. Aviation maintenance and logistics operations are critical to sustaining all aviation forces. Inherent are the functions required for the CSS of aviation brigade units as well as other maneuver, CS, and CSS forces.

b. ***Casualty Evacuation (CASEVAC).*** Aviation units-such as assault or medium helicopter forces-may have to augment the aeromedical capability during mass casualty situations or when the tactical situation dictates. During these situations, commanders must weigh the risk of transporting casualties by nonmedical resources that cannot provide en route medical care. Often a casualty may have a better chance of survival if left in the care of ground medical personnel until medical transportation assets arrive. Aeromedical evacuation units assigned to the MEDEVAC battalion have the primary mission for medical evacuation. They are employed well forward in the combat zone (CZ) in direct support of a division AO. Personnel may be evacuated from as far forward as the tactical situation permits, normally the maneuver supplies. Aviation maintenance /logistics operations are critical to sustaining all aviation forces.

SECTION VI. Battlespace

3-15. CONCEPT

a. FM 100-5 states that battlespace is a physical volume that expands or contracts in relation to the ability to acquire and engage the enemy. At the brigade level, it is determined by the range of direct fire systems and the terrain on which these systems are applied. Battlespace includes the breadth, depth, and height in which the commander positions and moves assets over time. Battlespace is not assigned by a higher commander and extends beyond the commander's current AO. Battlespace includes the combat power of all friendly forces that can be brought to bear against the enemy, including joint and combined forces.

b. An aviation brigade commander's battlespace is dictated by the organization's ability to acquire and engage the enemy with direct fire systems. It is not limited by division or even corps boundaries or graphics. Therefore-because attack aviation assets provide the force the greatest extension of direct fire capability-both the corps and division aviation brigade commander's battlespace is at least equal to the corps commander's battlespace. As a result of the aviation brigades ability-at both corps and division levels-to acquire and engage the enemy throughout a given AO, both corps and division aviation brigade commanders must be prepared to fight the corps deep battle as well as the division's close battle. For example, combat operations may require all attack battalions within the corps to conduct deep strikes against threat ground forces hours or even days before those threat forces enter into close combat operations with friendly ground forces. As the ground battle compresses in both time and space, all attack battalions within the corps may be required to focus on the division's close fight.

c. Within a given battlespace, aviation brigade commanders must understand the effects of geography and terrain; they must appropriately apply the use of organic capabilities and be prepared to integrate available joint and multinational assets in actual or potential operations.

d. The aviation brigade commander's potential battlespace extends out to the range of the attack helicopter assets; therefore, the aviation brigade staff should identify and plot all potential engagement areas (EAs) within that range. In addition, ATKHB primary and alternate BPs should be designated around the EAs, with proposed air corridors extending from the forward line of own troops (FLOT) to the various BPs. This identification and plotting process allows for a smoother and more expeditious transition into contingency operations. This is true especially if the ATKHB(s) are currently employed when the contingency operation develops.

e. Unity of effort is essential to operations within a given battlespace. Ownership of assets is less important than application of their effects toward an intended purpose. In that way, battlespace can overlap, shared by other commanders who perceive ways to employ their respective assets to mutual advantage.

3-16. SHAPING THE BATTLESPACE

a. The aviation brigade maneuvers rapidly and simultaneously in the ground commander's battlespace to bring decisive combat power to bear at the decisive points and times in the AO. There is an inextricable linkage between maneuver and fires. The aviation brigade maneuvers while leveraging organic firepower to shape the battlespace or conduct decisive operations as directed by the aviation brigade commander.

b. The aviation brigade commander compresses battlespace by shortening and/or mitigating the effects of time/distance factors and terrain on maneuver. His forces also reduce time requirements through speed and mobility once thorough planning is complete. The aviation

brigade's ability to operate in all dimensions of the battlespace provides a degree of flexibility and agility that is unique.

c. Synchronizing aviation maneuver with ground maneuver allows the friendly force commander to shape the battlespace to set the conditions for the close fight and achieve a potential advantage in time and space by altering the enemy's tempo. Linked with deep fires, the aviation brigade's maneuver offers the ground commander the capability to influence events simultaneously through the AO.

SECTION VII. Simultaneous Attack In Depth

3-17. CONCEPT

a. FM 100-5 takes the concept of warfighting beyond fighting battles sequentially. It discusses conducting operations throughout the enemy's depth to gain synergistic effects over an adversary. Simultaneous attack in depth means being able to attack and defeat the enemy anywhere between friendly rear and enemy rear boundaries, and to conduct these operations simultaneously. Simultaneous attacks-throughout the depth of the battlefield-place critical enemy functions at risk at the same time. They deny the enemy the ability to synchronize or generate combat power. They also deny the enemy the cohesion required to execute his plan. They induce friction into his scheme of maneuver and degrade his will to fight.

b. Fighting in depth expands the battlefield in time, space, resources, and purpose. Simultaneous attack is the application of combat power throughout the depth of enemy forces and functions in such a way as to cause destruction, confusion, and demoralization. This method provides the commander the focus necessary to strike decisively and denies the enemy options for conducting military operations. Thus, it allows the commander to completely dominate the tempo of the battlefield.

c. Through the joint surveillance target attack radar system (JSTARS), aviation brigades have access to battlefield technology that integrates and synchronizes tactical and joint systems. This technology gives them the ability to detect, track, and strike targets in depth. Combining enhanced acquisition, longer range delivery, and precision strike gives the commander the ability to mass devastating effects simultaneously with an economy of means.

d. Synchronization of deep, close, and rear operations is a complex undertaking. It requires a clear understanding of the commander's intent within the organization, stimulating both command and staff initiative. Effective operations, in depth, require dynamic, anticipatory responses to synchronize a variety of assets. The ultimate success in synchronizing deep, close, and rear operations determines the outcome of battles, major operations, and campaigns.

3-18. SYNCHRONIZATION OF CLOSE, DEEP, AND REAR OPERATIONS

Aviation commanders must expect to conduct close, deep, and rear operations simultaneously. For this reason, these operations consist of special and continuous synchronization requirements. For commanders at all levels, synchronization of close, deep, and rear operations requires deliberate planning and staff coordination. Commanders must understand the relationship among these three

arenas and their combined impact on the course of the battle. During such operations, aviation brigades conduct combat, CS, and CSS. As a member of the combined arms team, aviation brigades are key participants integrated into the offensive or defensive plan for close, deep, and rear operations. Aviation brigades can serve as a security force as well as a tactical reserve. The following sections focus on activities and functions of such operations.

3-19. CLOSE OPERATIONS

a. Close operations involve actions taken against enemy forces in contact with friendly ground forces. Close operations may be conducted simultaneously with deep and/or rear operations. Close operations at any echelon comprise the current activities of major committed ground combat elements together with their immediate CS and CSS. At the tactical level, close operations comprise the efforts of smaller tactical units-such as aviation brigades-to win current engagements. Close operations bear the ultimate burden of success or failure in combat. The success of deep and rear operations is measured by their eventual contribution to close operations. Close, deep, and rear operations are interdependent.

b. Integral activities during close operations include attack, assault, CAS, indirect FS (including counterfire), CS, and CSS of committed forces. During close operations, aviation brigades may be employed as a security or reserve force in the security or main battle area. Aviation forces are integrated and synchronized into the commander's scheme of maneuver.

c. Aviation brigades at all echelons conduct close operations. The planning and execution of close operations are discussed in detail later in this chapter.

3-20. DEEP OPERATIONS

a. Deep operations may be conducted simultaneously with close and/or rear operations. Deep operations comprise activities directed against enemy forces not in contact with friendly ground forces. The objective of deep operations is to delay, disrupt, or destroy enemy forces, facilities, and high-payoff systems. These activities are designed to influence the conditions in which current/future close operations are occurring or will occur. At the tactical level, deep operations shape the battlefield to obtain advantages in subsequent engagements. Successful deep operations create the conditions for future victory. The principal targets of deep operations are the freedom of action of the opposing commander and the coherence and tempo of his operations.

b. During deep operations, aviation brigades may conduct attack, assault, surveillance and target acquisition, deception operations, C^3CM, and C^3. Aviation brigades also may provide security for a larger force.

c. Aviation brigades at all echelons can conduct deep operations. The planning and execution of deep operations are discussed in detail later in this chapter as well as in Appendix G.

3-21. REAR OPERATIONS

Rear operations may be conducted simultaneously with close and/or deep operations. Rear operations at any echelon comprise activities rearward of elements conducting close operations. These activities are designed to ensure freedom of maneuver and continuity of operations, including sustainment and C^3. FM 71-100, *Close, deep, and rear operations (CS and CSS) sustainment*; **movements control (nontactical)**; **terrain management**; and **security**.

a. *Close, Deep, and Rear Operations Sustainment.* Aviation CS and CSS assets sustain other maneuver, CS, and CSS units in the rear area in support of current and future close, deep, and rear operations. They support the tempo of combat, ensuring the ability to take advantage of all opportunities without delay.

b. *Movements Control*. Aviation units may assist in movements control by providing C^2 aircraft to monitor or facilitate movements in the rear area. They also may assist through surveillance and protection of main supply routes (MSRs).

c. *Terrain Management.* Aviation forces take part in terrain management. They provide C^2 aircraft for rear C^2 assets to move rapidly in the rear areas to expedite terrain management operations. They also manage their assigned sectors, AAs, or support areas.

d. *Security.* Aviation brigades and subordinate units play a key role in rear area security. Attack, cavalry, or air reconnaissance units assist in the rear IPB. They can reconnoiter likely LZs, drop zones (DZs), and avenues of approach that may be used by the enemy. They may also detect and delay or defeat rear area levels of threat as described in Table 3-1 below. Aviation brigades or subordinate elements are employed mainly as a tactical combat force to counter level III incursions. They may delay or destroy enemy forces en route or after they have arrived in the rear area. As a tactical combat force (TCF), aviation assets are employed best with other maneuver forces to counter rear threats; however, they may be employed independently.

e. *Planning and Execution.* Aviation brigades at all echelons conduct rear area operations. The planning and execution of rear operations are discussed in detail later in this chapter.

Table 3-1. Levels of threat

Level I
Those enemy forces that base or base cluster defenses are capable of defeating.

Level II
Those enemy forces that base or base cluster defenses are not capable of defeating. Response forces, such as MPs, are required to counter Level II threats.

Level III
Those enemy forces that have entered the rear area and must be countered by tactical combat forces, such as infantry, armor, and aviation.

SECTION VIII. Planning And Executing Close, Deep, and Rear Operations

3-22. BATTLEFIELD FRAMEWORK

a. The battlefield framework helps commanders relate their forces to one another-and to the

enemy-in time, space, resources, and purpose. The battlefield framework establishes an area of geographical and operational responsibility for the aviation brigade commander. It provides a way to visualize how forces will be employed against the enemy.

b. At echelons above the aviation brigade level, the battlefield framework is agreed upon and coordinated. This framework results in a graphic depiction of the boundaries separating corps, divisions, maneuver brigades within the divisions, battle handover lines (BHLs) , and the separate corps and division deep operations areas of responsibility. From these graphics, the aviation brigade commander is able to determine on which geographical areas the close, deep, and rear operations planning processes will focus. These boundaries are provided to the aviation brigade staff by the next higher echelon. The aviation brigade staff, in turn, provides them to all subordinate battalion staffs.

c. Once the various force boundaries have been established and provided to the aviation brigade, the aviation brigade commander can begin the planning process. However-because of battlefield fluidity echelons above corps (EAC), corps and division aviation brigades can be employed anywhere in the corps sector-the boundaries designating specific operational areas of responsibility may change at any time. Therefore, aviation brigade commanders at all echelons must be ready to shift focus should the situation require.

3-23. TARGETING PROCESS

a. The close, deep and rear operations targeting process is initiated at echelons above the aviation brigade level. This process incorporates the ***decide***, ***detect***, ***deliver***, and ***assess (D³A) methodology*** defined below.

(1) ***Decide.*** The *decision* phase determines where the enemy will be attacked, what specific enemy systems will be attacked, the priority of those enemy systems designated to be attacked, when these enemy systems will be attacked, and what friendly attack systems will be employed during the engagements. This phase provides the focus and priorities for collection management and fire planning. This phase is a result of the intelligence estimate, the commander's mission analysis, current and future friendly force operations, and probabilities of enemy courses of action. As a result of this process, the brigade commander receives specific guidance regarding targeting information. Included in this guidance will be a developed targeting list.

(2) ***Detect.*** The *detection* phase begins with the aviation brigade staff tasking, and/or requesting, the support of intelligence gathering assets (sensors) to support the operation. The tasking/request for tasking of intelligence gathering assets should be accomplished immediately after the *decision* phase is complete. This tasking incorporates the sensors into the operations planning process early on; it increases the probability that the right sensors are focused on the right areas, at the right time. Once the designated targets have been observed and identified, continuous tracking by the sensors must be conducted. Observation, identification, and tracking information must be transmitted from the sensors to the various echeloned staff elements throughout the duration of the operation. Available battle command systems will determine which staffs receive information directly from the sensors and which staffs receive information transmitted down from their next higher. If onboard aircraft systems allow, pertinent information and intelligence also should be transmitted directly to the aircraft; this continues until the operation is complete. The aviation brigade commander must ensure

that all pertinent information/intelligence relative to the operation is provided-and updated as necessary -to the aviation brigade staff and executing units. Last, the aviation brigade commander must ensure that the detection process continues until mission completion.

(3) *Deliver.* The *delivery* phase is the execution of fires on targets. This phase is initiated by a trigger event or projected target activity. At this point, the aviation brigade launches organic and aviation assets under OPCON of the designated area of responsibility, conducts the operation, and returns to the AA. This phase may require several turnarounds in which aviation assets expend their ordnance or conduct air assaults, return to conduct FARP operations, then continue with the operation before returning to the AA for mission completion.

(4) *Assess.* Target *assessment* is the status of targets after the targets have been serviced, and should be conducted as soon as possible. Attack helicopter units should make every attempt to determine the status of their targets immediately after an attack and report their battle damage assessments (BDAs) up through the chain of command. Intelligence personnel should be present at the crew debriefing to extract critical data and follow-up initial BDAs. Gun camera tapes should be provided to higher whenever possible.

3-24. TASK ORGANIZATION

Based on mission analysis, the aviation brigade commander task-organizes assets under his command, which may require-

- Allocation/integration of C^2 aircraft from one subordinate battalion to another.
- Complementary employment of both assault and attack assets.
- Aircraft support for FARP operations.
- EW support aircraft.
- Utility/cargo helicopter support.
- An aviation CSAR task force (TF).

3-25. BATTLE COMMAND

a. *Command and Control.*

(1) The aviation brigade command process normally does not change between close, deep, and rear operations. Division aviation brigade assets may be under OPCON to a corps aviation brigade for the duration of an operation or corps aviation assets may fall under the command of a division aviation brigade commander. It is possible that aviation units will be under OPCON to a rear area commander-ground or aviation-for rear area operations. These possibilities further emphasize the fact that aviation brigade commanders and their units must be able to fight anywhere and anytime on the battlefield. Normally, the location where the operation will be conducted (corps or division operations area of responsibility) will dictate which aviation brigade commander commands the operation.

(2) In an operation where aviation assets are under the OPCON of another aviation brigade, the relinquishing/gaining commanders will ensure that the OPCON unit is

integrated-tactically and logistically-into the planning process as soon as possible. A liaison officer (LNO) from the relinquishing unit should be dispatched to the gaining command upon notification of the planned OPCON status. As soon as possible thereafter, the commander of the unit to be placed under OPCON should conduct personal coordination with the gaining aviation brigade commander.

(3) Aviation brigade operations require the concentrated efforts of the entire brigade staff to coordinate and synchronize. These extensive coordination and synchronization requirements involve numerous staff functions beyond the scope of a single aviation brigade staff. Specifically, the aviation brigade staff coordinates and synchronizes with other corps/division level assets, corps/division level staffs, subordinate maneuver units, adjacent units, supporting EAC units, and supporting service assets.

b. *Command Communications Systems.* Tactical information flow varies, depending on the individual unit's battle command systems capabilities. For over-the-horizon communications, some units may require fixed-wing relay while others are equipped with high frequency nap-of-the-earth (HF NOE) communications, while still other units may use satellite communications (SATCOM). As individual unit-ground and aviation-and joint communications systems are upgraded, information flow directly between sensors and shooters may prove to be more tactically advantageous to the aviation brigade and subordinate battalion commanders (i.e., reduced relay time).

3-26. CLOSE AND DEEP PLANNING ACTIONS

a. Planning is initiated with an operations plan/operations order (OPLAN/OPORD) passed down from a higher echelon to the aviation brigade. Paragraphs 3-27 and 3-28 discuss planning and execution actions generic to close and deep missions. Refer to Appendix G for a detailed checklist of deep operations planning and execution tasks.

(1) For ***close operations***, key OPLAN/OPORD information should include the commander's intent, scheme of maneuver, main effort, priority of fires, and support graphics such as the engineer overlay, fire control measures, and maneuver graphics. The OPLAN/OPORD also dictates if aviation brigade units are to be placed under the OPCON of a ground maneuver brigade (and, if so, which brigade[s]) or operate under the C^2 of the aviation brigade commander.

(2) For ***deep operations***, the OPLAN/OPORD should state the commander's intent, scheme of maneuver, and identify the aviation brigade as having priority of effort. Therefore, a direct support FA unit also should be designated to support the aviation brigade's deep operation.

(3) Despite the type operation, the OPLAN/OPORD identifies which engagement areas/air assault objectives will be the focus of the operation. If the operation is an attack, the OPLAN/OPORD should specify the destruction criteria-i.e., the minimum percentage of threat equipment to be destroyed-to achieve mission success.

b. The OPLAN/OPORD sets in motion these aviation brigade staff close and deep planning actions. (These actions assume that the aviation brigade commander retains C^2 over the brigade's assets during the operation.)

(1) ACTION: The aviation brigade commander establishes liaison-if not already

established-with the ground maneuver brigade commander(s) over whose ground space aviation assets will operate. If possible, initial coordination should be conducted face-to-face between the aviation brigade commander and the ground brigade commander (s).

(2) ACTION: The aviation brigade staff must seek and maintain situational awareness. Intelligence updates are the hinge upon which close, deep, and rear operations are planned and executed. The brigade staff must aggressively seek continuous, accurate intelligence and disseminated it to the subordinate battalions as quickly as possible. Simply waiting for the next higher to transmit intelligence data fails to maintain focus on the brigade commander's intelligence requirements. The enemy's location and capabilities on the battlefield significantly influence friendly mission planning and execution. Battle command systems are established that allow the brigade staff to request/receive intelligence updates directly from the next higher's G2.

(3) ACTION: The aviation brigade staff must ensure that the aviation brigade commander is aware of all available airspace that can be used during any given brigade operation. Airspace that is restricted from use or dedicated to other airspace users is indicated in the airspace control order (ACO). While the ACO contains all preplanned airspace control measures, it does not describe the most current air picture because of post-publishing changes and immediate airspace requests. Therefore, the brigade A^2C^2 element must continuously request airspace updates/changes from the next higher's A^2C^2 element. If airspace conflicts develop, the brigade A^2C^2 element must alert the next higher's A^2C^2 element immediately so the deconfliction process can begin.

(4) ACTION: The aviation brigade staff determines the size of the maneuver force required to successfully complete the mission.

(a) For **attack operations**, the brigade staff develops a gun-to-gun lay matrix. This matrix compares the relative combat power of an ATKHB against a given threat. In the example, the tank regiment has about 150 combat vehicles. Assuming an operational readiness rate of 90 percent, the tank regiment has 135 operational combat vehicles. If a 70-percent destruction criteria has been set by a higher echelon, then one ATKHB carrying 155 HELLFIRE missiles is a sufficient force to accomplish the mission (assuming a 70-percent probability of HELLFIRE missile hits).

(b) For **air assault operations**, the brigade staff coordinates with the supported ground unit to determine how many ground forces are required within a certain timetable in the LZs. This information determines how many aircraft are required at any given time during the operation. The brigade staff determines the number of UH-60 Black Hawk aircraft required-based on 12 combat troops per airframe (seats installed) and 15 combat troops per airframe (seats out/kevlar blanket installed). The brigade staff determines the number of CH-47 Chinook aircraft required-based on 33 combat troops per airframe (seats installed) and 60 combat troops per airframe (seats out). Units SOPs vary; therefore, an aviation LNO from the supporting brigade must verify these figures before any detailed planning takes place. The brigade staff coordinates attack helicopter air assault security, as required. The number of attack helicopters tasked to support the air assault varies

depending on the threat situation.

(5) ACTION: The brigade staff determines the size/task organization of the force required to execute the mission. Then the staff prepares and provides all subordinate units taking part in the operation with a warning order (WO). Next, the brigade staff starts to develop the OPORD/fragmentary order(s) (FRAGOs), as appropriate. The OPORDs/FRAGOs incorporate the next higher echelon's *decide, detect*, and *deliver methodology* into a brigade focus. All aviation brigade internal assets tasked to support the primary aviation unit executing the operation are under OPCON of the primary aviation unit upon receipt of the WO.

(6) ACTION: When conducting *attack operations*, the brigade staff determines the most tactically advantageous ATKHB BPs. When conducting *air assault operations*, the air assault task force commander (AATFC) and staff-in coordination with the aviation brigade staff-determine the most tactically advantageous landing zone areas (LZAs) for the AHBs. The brigade staff selects these BPs and LZAs. Then it provides overlays to the appropriate subordinate battalion staffs for further refinement and coordination. The brigade staff constructs ATKBN BPs based on-

(a) *Cover and concealment.* Depending on the threat acquisition systems, the geographical location of the BP may be the single most important factor in BP construction. Cover is protection from enemy direct fire. Concealment is protection from enemy visual or electronic observation. The BP should provide cover and concealment for aircraft not firing, and concealment for aircraft that are firing.

(b) *Width.* In close attack operations, there is a high probability that the subordinate attack battalion(s) are able to conduct reconnaissance of their intended BPs before the actual operation. In addition, attack units-operating in a close environment-stand a much higher risk of fratricide because of the proximity of friendly ground units. Therefore, the brigade staff should ensure that the width of the BP provides the executing aviation unit commander the freedom to maneuver in the vicinity of the EA, while remaining out of range of friendly armor and/or small arms weapon systems. Finally, the width of the BP should allow the attack commanders to engage the enemy as far rearward as the BHL. In deep attack operations, there is a high probability that the selected BPs will not have been reconnoitered before the arrival of the executing unit. In addition, the enemy may not be exactly where pre-aircraft launch intelligence estimates indicated they would be. Therefore, the brigade staff should construct BPs with as much width as the tactical situation will allow. This provides the executing unit commander as much flexibility as possible once in the vicinity of the EA.

(c) *Depth.* The BP depth should extend from the edge of EA to an established rear boundary. The distance from the closest edge of the EA to the rear boundary of the BP should be the same distance as the optimum range of the primary heliborne weapon system to be used. For example, if an AH-64 battalion is used in the attack, the depth of the B should be 9 kilometers (kms) from the edge of the EA to the rear boundary of the BP. (Once inside the BP, the attack commanders will decide the most tactically advantageous firing positions.)

(d) *Altitude.* The altitude of the BP should be the same or higher than the EA. A

position above the EA allows the attack/reconnaissance aircraft a better field of view and the advantage in the engagement.

(7) ACTION. The brigade staff coordinates with the supported ground unit when determining the location(s) of the deep operation LZAs. The LZA is a grouping or cluster of one or more LZs to be used in the deep operation. Each LZA has an on-call restricted operations zone (ROZ) constructed around it. The brigade staff constructs assault helicopter battalion (AHB) LZs based on the following:

> **(a) *Proximity to the objective.*** LZ locations are objective based-i.e., oriented on the objective- while incorporating all the factors of METT-T.

> **(b) *Terrain conditions.*** Terrain-specifically slope and ground conditions-dictates whether or not helicopters will be able to land in a potential LZ. Visual reconnaissance of the potential LZ may be difficult or impossible because of the tactical situation. Therefore, a careful map study of the LZ is necessary to determine suitability for landing.

> **(c) *Obstacles.*** The terrain in and around the LZ should be analyzed to determine its effect on air traffic patterns. The approach and departure paths should be free of obstacles.

(8) ACTION: The brigade A^2C^2 cell requests an on-call ROZ encompassing the EA(s), BPs, and/or LZAs. The ROZ provides the executing aviation unit commander freedom of movement (within certain constraints), control of fires, and fratricide prevention while operating in the ROZ. The purpose of the "on-call" status of the ROZ is to alert the next higher's A^2C^2 cell that the ROZ will be activated only during mission execution and the activation time is pending. The on-call ROZ request is submitted and coordinated through the next higher's A^2C^2 cell to the battlefield coordination element that coordinates airspace requirements with the theater/joint force airspace control authority at the air operations center (AOC). ROZs-like most airspace control measures-must be approved by the airspace control authority (ACA). There is a time lag between the time of the request and ultimate approval by the ACA. The A^2C^2 cell needs to be proactive to submit these requests with enough time to clear the airspace and get approval.

> **(a) *ROZ dimensions.*** The request for an on-call ROZ will include the ROZ dimensions. If an AHB is the primary aviation unit conducting the operation, the ROZ dimensions should include the EA plus a 9-km buffer zone-based on the AH-64's maximum standoff range-around the attack battalion's BPs. If an AHB is the primary aviation unit conducting the operation, the preference will be to request one ROZ that encompasses each LZA.

> **(b) *ROZ activation time.*** The request for the on-call ROZ will include a ROZ activation time. The ROZ activation time is the expected window of time during which executing aviation units will operate in the ROZ. The ROZ activation time is based on the executing aviation unit's departure from the AA or forward AA en route to the BP or LZ. The aviation brigade staff continuously updates the next higher's A^2C^2 cell on the expected ROZ activation time.

> **(c) *ROZ deactivation time*.** The request for the on-call ROZ will include an

estimated ROZ deactivation time. The ROZ deactivation time is that time when the executing aviation units will no longer conduct operations in the ROZ. This time is based on the expected time of the last aircraft returning cross-FLOT into friendly territory, i.e., mission completion.

(9) ACTION: The brigade staff selects the Standard Army Aircraft Flight Routes (SAAFRs) and constructs the on-call air corridors to be flown during the operation. SAAFRs are a network of established aircraft routes facilitating the movement of army rotary-wing aircraft. They usually extend from the corps rear area to the rear areas of the ground maneuver brigades. Aviation units conducting operations will transit along the SAAFRs until the route turns into an air corridor. Air corridors are the flight routes army aircraft use after crossing the FLOT; they are temporary in nature. Once the SAAFRs have been selected and the air corridors have been constructed, the brigade staff provides them to the subordinate battalion(s) executing the operation for coordination. After coordination has been conducted with the executing battalion(s), the brigade staff submits the SAAFR and on-call air corridor plan (including expected usage times) to the next higher echelon A^2C^2 cell for approval and coordination. The purpose of the "on-call" status of the air corridors is to alert the next higher's A^2C^2 cell that the air corridors will be activated only during mission execution and the activation time is pending. The brigade staff ensures that all airspace is deconflicted before mission execution. Although SAAFRs do not require ACA approval, it is still critical that the locations of these routes are known and plotted by the ACA and all units they might affect. The weapons control status for AD weapon systems under a SAAFR should be tight to prevent fratricide. In most theaters, the ACA designates that status.

(a) *Standard Army Aircraft Flight Routes (SAAFRs).* The brigade staff selects SAAFRs based on-

- ***Entry/Exit procedures.*** Aviation units will be located at fixed bases or AAs. These locations will have established entry/exit procedures before the conduct of any aviation operations. SAAFR selection must consider these entry/exit established procedures.

- ***Terrain.*** SAAFR selection should exploit the concealment provided by the geographical environment. High terrain that can be scanned by threat electronic capabilities should be avoided. Aircraft cresting the high ground can provide the threat with radar signatures even at extended distances.

- ***Fire support systems.*** Although SAAFRs are constructed to avoid ground-based FS systems, artillery units may displace frequently. These artillery location shifts should be monitored by staff elements above the aviation brigade level; the brigade staff should be alerted when such an event takes place. In the event artillery units do displace to positions within the dimensions of a SAAFR-and the SAAFR is considered to be the best tactical route to the FLOT-then the aviation brigade staff must ensure that all artillery tubes, rocket launchers, and missile systems are shut down during the operation. This deconfliction process is coordinated through the next higher's A^2C^2 cell.

- ***Minimum risk routes (MRRs).*** An MRR is an air route used by high-speed, fixed-wing aircraft to transit from rear locations to regions across the FLOT.

SAAFR selection should avoid active MRRs, although the tactical situation dictates whether or not this can be accomplished. Avoidance of active MRRs reduces planning factors and execution considerations.

- **Special operations activities.** Army and Air Force SOF will use the same SAAFR network as Army aviation aircraft. SAAFR selection must consider other forces conducting operations using the same SAAFR airspace.

(b) ***Air corridors***. The brigade staff construct/select air corridors based on-

- **Dimensions.** Air corridors should be 1-km wide and for one-way traffic only. Air corridors will extend from the surface up to the coordinating altitude. The ACO stipulates the coordinating altitude.

- **Enemy ADA.** Enemy ADA is the single most important factor in the selection of an air corridor. Enemy acquisition and weapons engagement ranges must be plotted to ensure that the executing aviation unit has the greatest possible chance for mission success. The effects of terrain on threat acquisition and weapons engagement ranges must be considered when constructing air corridors. The result should be air corridors that provide the executing aviation unit commander with the flight path of least resistance.

- **Enemy ground order of battle (GOB).** Enemy ground units (other than ADA) can present as much of an AD threat as primary AD weapon systems. Air corridor construction should be planned through the areas that intelligence channels indicate as having the least amount of ground units.

- **BP/LZA entry and exit points.** The release point (RP) of the air corridor should facilitate a tactical ingress into the battalion's BP/LZ. Reciprocally, the start point (SP) of the return air corridor should facilitate a tactical egress from the battalion's BP/LZ. The enemy situation dictates the location of both the ingressing RP and egressing SP.

(10) ACTION: The brigade staff plans for localized JSEAD even if aircraft penetration into hostile territory is to be conducted under stealth conditions. If a subordinate battalion within the aviation brigade has been OPCONed to a ground maneuver unit-e.g., an air assault battalion under OPCON of a ground air assault task force [AATF]-then the gaining command is responsible for planning and executing JSEAD operations. The supporting aviation unit provides assistance. However, when the aviation brigade is tasked to conduct brigade-level assault and/or attack operations, the aviation brigade staff plans and executes JSEAD operations. The aviation brigade staff plans JSEAD as follows:

(a) The brigade staff continues to monitor and update the threat situation along the on-call air corridors and ROZ(s). This process continues until mission completion. All intelligence updates are passed to the subordinate battalions as quickly as possible.

(b) The brigade staff requests on-call suppression of all current and potential threat acquisition and engagement systems along the air corridors and in the ROZ(s). Fires will be planned for the entire time aviation elements are across the FLOT. If the JSEAD fires are to be executed by the brigade staff-i.e., timed JSEAD-the duration of the suppressive fires vary depending on the threat situation; however, but the last round should impact 2 minutes before friendly aircraft transition the area. Therefore, SEAD fires for any given area should equal aircraft transition time minus 2 minutes. If the

SEAD fires are to be executed by the executing aviation unit, then the executing aviation unit commander will initiate the SEAD fires.

(c) The brigade Air Force/Air and naval gunfire liaison company (ANGLICO) representative(s) request on-call suppression of all current and potential threat acquisition and engagement systems along the air corridors and in the ROZ(s) that cannot be suppressed by Army indirect FS systems. In addition, all service component laser identification codes are retrieved from the ACO (or appropriate source) and provided to the executing ATKHB.

(11) ACTION: The brigade staff coordinates the air movement of Army air transportable artillery systems that must be repositioned by air to support the SEAD operation. If brigade external air movement assets are required for this operation -i.e., additional utility/cargo helicopter support- requests are submitted through the next higher's G3. Additional utility/cargo assets tasked to support another aviation brigade are under OPCON of the gaining command for the duration of the air movement operation. This may include artillery system repositioning after the operation is complete.

(12) ACTION: The brigade staff plans for EW aircraft support. This includes all Army and joint EW aircraft that can be tasked for the operation. This support will be on-call. The brigade staff confirms that tasked joint assets are specifically designated for the operation in the ACO. The brigade staff plans for/request airspace ROZ(s), as necessary, for the brigade internal EW assets. The tactical situation is considered when planning the location of EW aircraft orbits ROZ(s).

(13) ACTION: The brigade staff plans for/request communications support aircraft (e.g., Improved Guard Rail V) as required to maintain/supplement over-the-horizon communications. Communications support also may be provided by joint assets-e.g., Airborne Warning and Control System (AWACS). Army (aviation brigade external) and Navy communications support aircraft assets are requested through the next higher's G3. The brigade Air Force LNO requests Air Force aircraft communications support through Air Force channels. Liaison personnel ensure that the aviation brigade staff is provided with the proper frequencies for any given operation.

(14) ACTION: The brigade staff integrates FARP operations into the operation. Aircraft supporting FARP operations must be given the same advance notice as other executing units in the operations WO. If subordinate units require a FARP to be positioned on terrain not controlled by the aviation brigade, then the aviation brigade staff must request nonaviation brigade terrain usage through the next higher's G3. After receiving approval for terrain occupation, aviation brigade liaison personnel should conduct face-to-face coordination with the unit owning the terrain.

(15) ACTION: The brigade staff ensures that all communications procedures have been coordinated with the appropriate subordinate unit commanders and staffs. Although the brigade staff plans for JSEAD fires and EW support, the executing aviation unit commander probably will give the order to shoot fires and activate EW support. The brigade staff must ensure that all brigade internal and external communications frequencies are coordinated horizontally and vertically.

3-27. CLOSE AND DEEP EXECUTION ACTIONS

a. A trigger event drives the execution of an attack operation. A trigger event is an enemy or friendly action that causes the ATKHB to launch and engage the enemy. Examples of a trigger event may be a threat armored force transitioning through a named area of interest (NAI) or a friendly force conducting an attack operation in another part of the theater. The next higher's staff notifies the aviation brigade of the trigger event.

b. The execution of an air assault operation is time driven or event driven. The time sequence for a time-driven air assault operation is stipulated in the next higher's OPORD. Final coordination times for an air assault operation are synchronized between the executing air assault unit and the supported ground unit. An example of a trigger event for an air assault operation would be that a successful deception operation has been conducted in another part of the AO. The event shifts the enemy's focus and security away from the air assault objective. Again, final coordination times are synchronized between the executing air assault unit and the supported unit.

c. The trigger event is the catalyst by which the aviation brigade's next higher echelon gives the command to execute the deep operation. Upon notification to execute the deep operation, the aviation brigade staff executes the following actions:

(1) ACTION: All subordinate executing units are directed to increase their readiness conditions to a final pre-launch status. Those units under OPCON to the primary executing aviation unit are notified by their controlling headquarters. Local SOPs dictate the amount of time required to attain the final pre-launch status, but the command to launch will be transmitted only after all other pre-launch procedures have been coordinated. Mission execution orders are transmitted to subordinate units by the quickest, most secure means available.

(2) ACTION: The aviation brigade staff provides a final pre-launch intelligence update to the executing unit(s). This update is conducted either face-to-face with unit commanders or transmitted electronically.

(3) ACTION: The aviation brigade staff requests-through the next higher's A^2C^2 cell-the activation of all ROZs, air corridors, and special use airspace (SUA) relevant to the operation. In addition, the staff alerts the next higher's A^2C^2 cell that use of the SAAFR will commence with aircraft launch. The brigade staff verifies that all requested airspace has been activated before aircraft launch. Airspace deconfliction takes time so these requests need to be submitted well in advance of mission execution.

(4) ACTION: The aviation brigade staff requests JSEAD FS. Service component liaison personnel and the brigade FSO alert/update their appropriate brigade external staffs. The final command to fire JSEAD may be generated by the brigade staff, but probably will be generated by the executing aviation unit commander or designated air mission commander.

(5) ACTION: The aviation brigade staff alerts the next higher's G3 if over-the-horizon communications activity can be expected. Request are made to alert the supporting Army and joint aircraft.

(6) ACTION: The aviation brigade staff alerts the brigade's FARP elements that the operation is being executed.

(7) ACTION: After ensuring that all pre-launch procedures have been coordinated, the aviation brigade commander/staff orders/directs the subordinate unit commander to launch and execute the mission.

(8) ACTION: The aviation brigade staff receives subordinate battalion BDA reports and updates the next higher echelon as required.

(9) ACTION: Upon mission completion, the aviation brigade staff requests deactivation of all ROZs, air corridors, and special use airspace (SUA) relevant to the operation. This request is conducted through the next higher's A^2C^2 cell.

3-28. REAR AREA PLANNING AND EXECUTION

Rear area combat operations usually require immediate response. Therefore, planning actions should incorporate all possible contingencies.

a. *Rear Area Planning*. To plan rear area operations, the aviation brigade must understand the next higher commander's priorities of protection. The brigade also must have the next higher's rear operations plan. In addition, the brigade must conduct a thorough IPB and establish the C^2 functions peculiar to rear operations. The priority of protection list includes all of the critical assets that the next higher commander has designated to be secured in the rear area. These assets may include-

- C^2 facilities.
- Ammunition supply points.
- Class III facilities.
- Corps/division reserve forces.
- Main supply routes (MSRs).
- Bridges.
- Corps/division support area.

b. *Protecting Assets.* The next higher commander assigns the priorities for the protection of these assets. These assets are placed on a standing list in the order of precedence. Intelligence and AD assets are vital; they must be focused according to the rear operations plan. Also, the corps aviation brigade must coordinate with these assets. The brigade also must maintain communication nets with these assets.

(1) The rear CP publishes the rear area OPLAN. The OPLAN contains tactical guidance, task organization, and assignment of missions to various elements that are assigned to protect the rear area. This plan normally is transmitted as an annex to the OPLAN or OPORD. It contains specific information-such as unit locations and FS coordination measures-required to develop the aviation brigade staff's OPLAN for rear operations. The corps rear OPLAN allows the aviation brigade and subordinate units to begin preparing for employment in the rear area. For example, attack assets with an on-order rear operations commitment can start reconnoitering BPs and routes to BPs-day, night, night vision devices (NVDs)-around critical rear area assets. Assault helicopter units-with an on-order rear operations mission-also can begin reconnoitering routes (primary NVD-day) while looking for suitable LZs around critical assets. Artillery and infantry units should be collocated with their respective assault and medium helicopter

units. Coordination with bases or base clusters and AD units also is essential. This planning helps ensure that the employment of aviation units in rear operations is highly responsive.

(2) Fundamental to the aviation brigade's employment in rear operations is an extensive IPB both behind and beyond the FLOT. This IPB results in fairly accurate predictions of threat objectives in the rear area as well as air and ground avenues of approach to these objectives. The rear CP can develop an LZ or PZ denial plan by the rear CP based on LZs identified by the IPB. Aviation assets also may play a vital role in producing or contributing to the IPB. For example, these assets can reconnoiter possible LZs and routes used by the enemy. The results of the IPB and METT-T then are considered by the aviation brigade when assigning missions and priorities to subordinate units. With limited aviation assets, other forces-such as AD units-must be integrated to cover suspected AAs, LZs, and likely objectives. The IPB-which allows for the allocation of various early warning systems defined below-ensures that the tactical combat force (TCF) has enough notice and reaction time to employ its combat forces.

> **(a)** Human intelligence (HUMINT).
>
> **(b)** Signals intelligence (SIGINT).
>
> **(c)** Communications intelligence (COMINT).
>
> **(d)** Electronic intelligence (ELINT).

(3) C^2 of rear operations rests with the rear CP. Base clusters and TCFs report to the CP when executing the rear operations plan. To be tied into this C^2 network, the aviation brigade establishes voice communications with the rear CP. It also sends an LNO to assist in aviation planning at the corps level. Once an incursion is detected, the responding force establishes voice communications with the base defense or base cluster targeted by the threat incursion. Keep in mind that the TCF normally woudl respond only to a level III rear area incursion. The base cluster defense handles level I incursions. Level II incursions probably will require some external assistance like an MP unit.

(4) The final stage of rear operations planning for the aviation brigade is the control portion of the C^2 process. After analyzing the IPB products, the priority of protection, and the corps rear OPLAN, the aviation brigade identifies several decision points or time lines that optimize aviation employment. The rear CP ensures that the appropriate assets -joint acquisition, detection, and intelligence collection assets-both aerial and ground-are concentrated on that area of the battlefield. It also ensures that adequate warning is given to the aviation forces involved in rear operations. Finally, all aspects of planning for rear operations must be coordinated into a realistic and timely alert status (THREATCON); thereby, the aviation brigade's forces can respond quickly.

c. *Execution Methods.* Once the incursion-imminent or actual-into the rear area has been detected-and determined to warrant aviation commitment-the actions of the aviation brigade for countering the threat force fall into two categories. These categories are *attack on the en route threat force* and *attack on a landed threat force in the rear area.*

> **(1) *Attack on the en route threat force.*** The attack on the en route threat force

primarily applies to countering a heliborne or airborne threat. Orientation of friendly detection systems toward IPB-developed staging areas and air avenues of approach aids in early detection. Such detection systems include short-range air defense (SHORAD) early warning nets; forward area air defense (FAAD); and C^2I. This early detection helps neutralize or destroy the threat force in the air. Also, aviation brigade units -primarily attack helicopter units- have some limited air combat capability that can complement the ground AD effort. They can compel threat aviation forces to fly evasive maneuvers into the acquisition and attack envelopes of friendly surface-to-air systems. Therefore, a refined A^2C^2 plan helps destroy the threat force while minimizing the potential hazard of engagement by friendly AD systems.

(2) *Attack on a landed threat force.* Attack on a landed threat force by aviation brigade elements in the rear area may be the least desirable employment option. Currently, however, it is the most probable course of action because of the speed with which the enemy can conduct rear area incursions. Employment must be anticipatory; therefore, the aviation brigade's intent should be to destroy threat forces before they reach the rear area. If they are not destroyed, however, threat forces may be countered by a combination of attack helicopter and air assault actions prescribed in the rear area operations plan. As the brigade's forces develop the situation, additional combat forces are added, as required. Air cavalry units and light infantry are ideal forces for this mission using search and attack.

SECTION IX. Corps Airfield Operations

Within the corps rear area, one or more airfields may be required. Normally, the airfields will be a primary and an alternate. An airfield is any area-with or without personnel-designated for takeoffs and landings by fixed-wing aircraft.

3-29. CORPS AIRFIELD PARTICIPANTS

Probable users within the combat zone include USAF tactical airlifts and MEDEVAC-as well as Army military intelligence (MI) units, command aviation aircraft (fixed-wing), and logistical support units. Engineers may help establish or construct corps airfields and also provide crash rescue. MPs may be employed for security.

a. Doctrinally, USAF airlifts-during combat operations forward-support combat forces at any level of conflict on a sustained basis. They also evacuate casualties from forward of the corps. Operations forward consist of three categories. First, routine operations support the corps support area (CSA). Second, emergency operations support division areas. Third, rear operations support brigades. Airlift support of these contingencies depends on the availability of US aircraft and the establishment of airfields that can accommodate and handle containerized cargo. Terminal operations for C-130 or C-17 aircraft require an all-weather, day-and-night landing capability. They can use unimproved runways of at least 3,000 feet during day operations; however, they require 4,000 feet for night operations. ATS will be provided by ATS units and USAF combat control teams (CCTs) for the first 72 hours. Afterward, ATS becomes the sole responsibility of Army ATS units.

b. The MI battalion (aerial exploitation(AE)) provides EW target acquisition support to the corps. The aerial EW company has 12 RU-21 or RC-12 aircraft. These aircraft normally operate at corps fully instrumented airfields. An airfield service section provides airfield service support to the battalion. Support includes aircraft fueling and emergency airfield lighting. EW missions require near all-weather, day-and-night landing capability. The heavy electronics configuration and structural design limit the aircraft to airfields with improved 5,000-foot runways.

c. The command aviation battalion has five assigned fixed-wing aircraft that enhance C^3I functions for corps operations. These aircraft mainly perform utility and command liaison missions. These aircraft must have an all-weather capability; their primary mission is to transport high-ranking military command and staff officials. The aircraft must have an instrumented airfield with an improved 5,000-foot runway.

d. Logistical support units-such as a corps support command (COSCOM)-may need an airfield to receive bulk supplies or evacuate damaged equipment.

3-30. CORPS AIRFIELD RESPONSIBILITIES

The main purposes of an airfield are to serve fixed-wing aircraft and support logistical operations for the corps and its subordinate units. If required, corps aviation fixed-wing assets may use an airfield at a USAF installation or a hard surface such as a road or an expressway. However, the corps commander may direct that a corps Army airfield be established and maintained. If so, several corps-level units will establish and maintain the airfield. An airfield commander must be appointed and support assets allocated.

a. *Airfield Commander.* Within the corps aviation brigade, the corps aviation group commander may serve as the airfield commander or he may direct that the command aviation battalion commander or ATS battalion com- mander establish and operate the airfield. The corps aviation group also may provide support assets to include a flight operations section for base operations, ATS, and aviation maintenance support.

b. *Construction and Crash Rescue.* Corps engineer units can construct and maintain specified airfield facilities. They also provide crash rescue in support of airfield operations.

c. *Logistics.* COSCOM units are directed to provide logistical support of airfield operations; this support primarily includes Classes I, III, and V. Other services provided are transportation and movements control for USAF airlift operations of bulk supplies.

d. *Medical Evacuation.* Medical units may position corps medical units at the airfield for liaison between Army and USAF MEDEVAC forces. Army medical units also may provide medical support for airfield operations on-site.

e. *Security.* MPs provide security for corps airfield operations. Other forces, such as infantry, artillery, and airfield participants or host nation assets may augment security operations.

SECTION X. Covering Force Operations

3-31. CORPS COVERING FORCE

When designated as the corps covering force, the aviation brigade must have enough ground maneuver forces and CS and CSS assets-including additional communications support-to achieve the full effect of the combined arms team. The strength of the covering force depends on the size of the security area and the intensity with which the corps commander intends to fight the battle. It also is based on the number of other contingencies for which the corps must prepare. The aviation brigade as a whole may or may not be employed in such operations. Normally, only those corps aviation brigades assigned to corps without an assigned ACR are employed as a covering force headquarters. The attack regiment headquarters may be given the mission and augmented as necessary. During covering force operations, specific tasks for corps attack assets include reconnaissance and screening operations. These assets may also be held as a tactical reserve to exploit friendly attacks or to counterattack enemy penetrations. Assault and medium helicopter units provide assets to conduct air assaults on other counterattack forces. These units also provide CS to reposition critical personnel, equipment, and supplies.

3-32. DIVISION (DEFENSE) COVERING FORCE

The aviation brigade provides the division commander with new options for determining the best allocation of resources for the covering force mission. The division commander may augment the covering force with assets from the aviation brigade; for example, cavalry squadrons or ATKHBs. In this case, an attached or OPCON relationship is appropriate to share the burden of supporting these elements for the duration of the covering force battle. The ground brigade commander may use assets from an assault helicopter company (AHC) to transport engineer barrier material forward. He may also position FARPs to support brigade units in the security area. After the covering force passes, he plans and coordinates actions to refit these units for future missions. If the division has to constitute its own covering force, the aviation brigade headquarters can plan and control the covering force battle. If the aviation brigade commander is assigned the covering force mission, the other ground brigades will be free for detailed preparation of the main battle area (MBA). In this situation, the division commander task-organizes the aviation brigade with additional ground maneuver, CS and CSS assets.

   a. *Aviation Brigade as the Covering Force Headquarters.* When designated as the covering force, the aviation brigade must have adequate ground maneuver forces and CS and CSS assets to achieve the full effect of the combined arms team. The strength of the covering force depends on the size of the security area and the intensity with which the division commander wants to fight the battle. It also is based on the number of other contingencies for which the division must prepare.

   (1) Table 3-2 shows an example of task organization for a covering force mission. This example depicts a covering force for the air assault division (ASD). Here, the aviation brigade is augmented with two air assault battalions (ASBs) and an appropriate mix of CS assets. The ASBs are task-organized according to the commander's concept of the operation and METT-T. Similar considerations are applied to the distribution of CS assets. This example also indicates that two of the brigade's organic attack helicopter battalions are being retained under division control for contingencies in deep or rear operations.

Table 3-2. Task organization for covering force mission

<u>TF 1-324 (AASLT)</u>	<u>BRIGADE CONTROL</u>
1-324 IN	1-102 AVN (AHB)
2/A/1-541 Air Defense (DS)	2-102 AVN (CAC)
2/C/354 Engineer (DS)	3-102 AVN (MHB)
	2-14th FA (105 TOWED) (DS)
<u>TF 3-554 (AASLT)</u>	1-19th FA (155, TOWED) (DS)
3-544 IN	A/1-541 Air Defense (-) (DS)
1/A/1-541 Air Defense (DS)	C/354 Engineer (-) (DS)
3/C/354 Engineer (DS)	1/B/321st MI BN (DS)
	1/329 NBC DEF CO (DS)
<u>2-19th ARS</u>	FSSE, DISCOM (DS)
<u>1-227th ATKHB</u>	
<u>3-227th ATKHB</u>	

(2) The aviation brigade commander must ensure that adequate CSS elements are available to sustain and maintain the force. A logistics composite support unit (LCSU) may be configured to support covering force operations. The LCSU includes assets from the DISCOM, COSCOM, and appropriate forward service support elements or mobile support teams and the parent unit that accompany ground maneuver units augmenting the covering force. Initially, this unit would locate close to the forward edge of the battle area (FEBA), perhaps to the rear of the forward MBA positions, to provide responsive support. These support elements or units may include service and supply, maintenance (air and ground), and medical support elements.

(3) The aviation brigade commander and staff provide timely C^2 during the covering force battle. This C^2 is assisted by clear and concise mission guidance, battlefield control measures, FRAGOs, and responsive communications. To maintain communications with forward elements in the covering force, the headquarters may use line-of-sight (LOS) or non-LOS communications systems. CPs usually are echeloned with a main CP positioned to the rear of the security area and a tactical CP positioned for optimal control of the battle. The tactical CP is composed of ground vehicles or aircraft.

b. *Ground Task Force Roles.* The covering force commander usually task-organizes ground maneuver battalions. His decision is based on his concept of the operation and METT-T. TFs are integrated into the maneuver scheme with aviation and reconnaissance assets to fix and destroy enemy forces. When operating in the covering force, ground maneuver battalions echelon their trains. The location and composition depend on METT-T. The same support precepts apply as for other operations. Normally, field trains are located to the rear of the security area while combat trains may be located well forward, depending on METT-T. Ground maneuver forces are given missions to delay, defend, and counterattack.

(1) TFs cause delays to trade space for time. Delays can also draw the attacker into

positions that expose the enemy's flank or rear units to counterattack. Successful delay operations mainly slow the enemy's advance to gain time. Their secondary role is to destroy as much of the enemy force as possible yet preserve the freedom of maneuver. These tasks are accomplished by forcing enemy forces to deploy and react to successive engagements without allowing them to achieve decisive results. Such actions are costly to the enemy in time and attrition of combat power.

(2) During covering force battles, TFs may defend to retain key terrain or to deny or canalize enemy movement along a specific avenue of approach. They also defend to stop the enemy in EAs that foster counterattacks. TFs may defend in sector or from BPs or both. In some operations using the economy-of-force principle of war or when portions of the security area are more defensible than others, the commander may employ a combination of sectors and BPs. Figure 3-1 illustrates the options for the disposition of forces in the defense.

(a) *Sectors.* Sectors are designated along the most defensible terrain astride enemy avenues of approach. They clearly define areas for which a TF commander is responsible. Because sectors are less restrictive than designated BPs, the TF commander selects BPs or sectors for company teams. When sectors are established, the movement of individual TFs can be monitored by imposing phase lines as control measures.

(b) *Battle positions.* When the security area is clearly dominated by key terrain features, it may be better to designate TF BPs. In this instance, the covering force commander first identifies likely enemy avenues of approach; then he selects EAs and BPs throughout the security area on terrain that dominates those avenues. Thereby, he is able to control the battle by having the TFs occupy the BPs and delay, defend, or attack from them.

(3) To seize the initiative, the covering force commander plans and conducts counterattacks when opportunities occur. His aggressive action stalls the momentum of the attack and forces the enemy to react continually to the expected. Counterattacks may be oriented on destroying enemy forces or on seizing key terrain. Local counterattacks must be executed rapidly. The division commander supports his covering force operations with battlefield interdiction or deep attacks to delay and disrupt follow-on forces; at the same time, a local counterattack is conducted against first-echelon elements. Counterattacks may be conducted by positioning units to neutralize enemy forces by fire or by maneuvering units against the enemy's flanks or rear units. The aim is to sever LOCs and to envelop the force. Figure 3-2 illustrates the possibilities for local counterattacks when ground maneuver forces are employed with aviation assets.

DEFEND
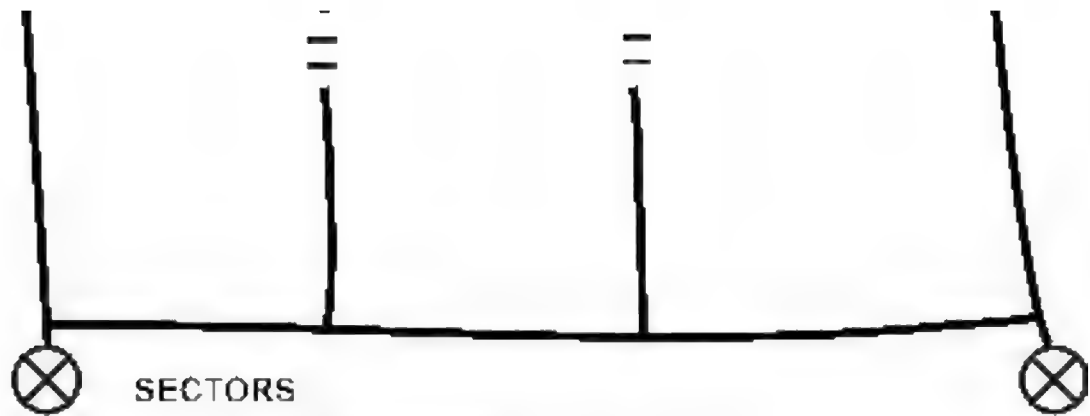
SECTORS
LEAST RESTRICTIVE
LESS DISTINCT AVENUES OF APPROACH
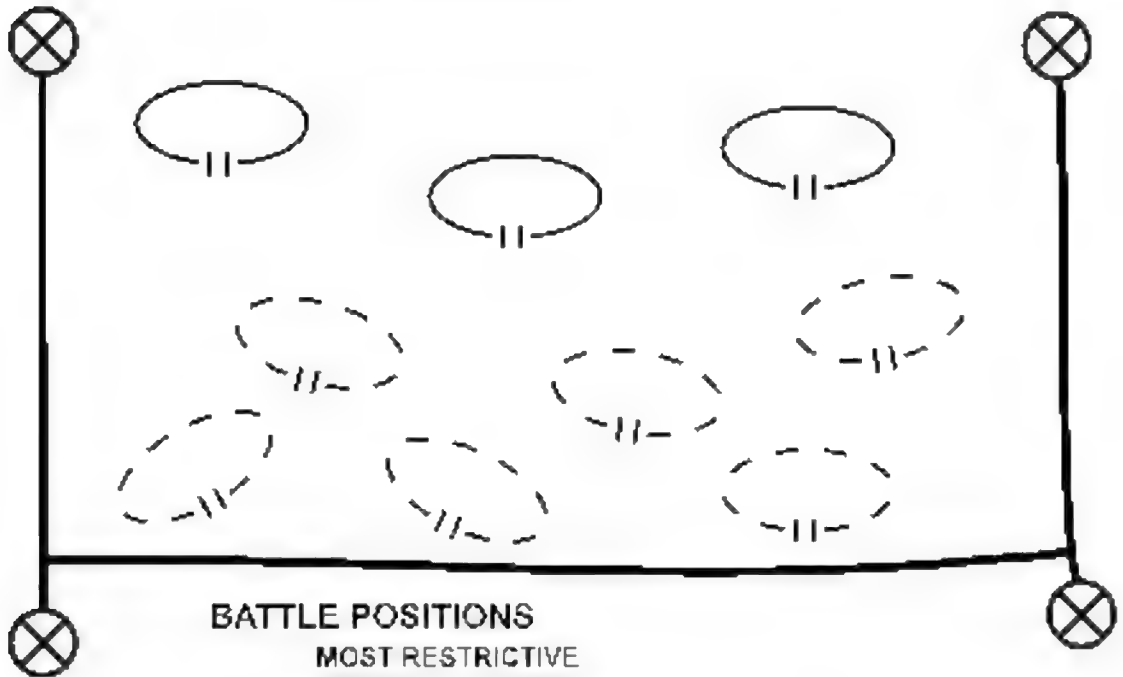
BATTLE POSITIONS
MOST RESTRICTIVE
DOMINANT TERRAIN
DISTINCT AVENUES OF APPROACH
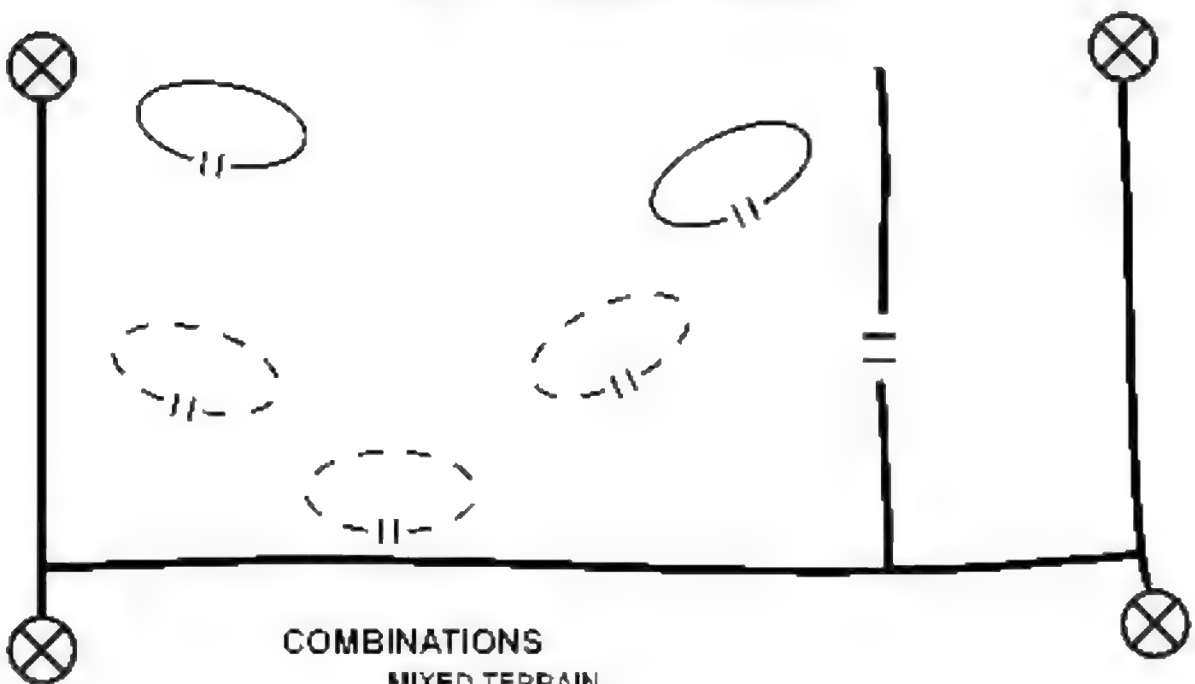
COMBINATIONS
MIXED TERRAIN
DIFFICULT TO CONTROL

Figure 3-1. Disposition of forces in the defense

c. *Aviation Brigade Roles.* As the controlling headquarters, the aviation brigade commander normally employs all subordinate units during covering force operations. Likewise, when the brigade is not the covering force most of the brigade will be employed by the controlling headquarters.

(1) *Cavalry squadron roles.* During covering force operations, cavalry and air reconnaissance forces perform reconnaissance and security operations.

(2) *Attack helicopter battalion roles.* The attack helicopter battalion is one of the primary tools with which the covering force commander retains the offensive spirit. As implied by its name, the mission of the ATKHB is to attack. With its maneuver speed, it responds quickly to contingencies throughout the security area. ATKHBs normally are employed from forward AAs or attack positions in the rear of the security area. This rear location affords limited protection from enemy indirect fires but provides responsiveness throughout the security area.

(a) Under most conditions, attack helicopter units should not be employed below battalion level. Attack helicopter companies do not have the resources to recycle elements for sustained engagements between the FARP and the AO. The ATKHB, however, can accommodate different mission profiles as depicted in Figure 3-2. It may employ its attack companies in three modes: *maximum destruction*, *phased employment*, or *continuous attack*. FM 1-112 contains more detail on the employment of attack helicopter units.

(b) One of the precepts of Army operations doctrine is to fight as a combined arms force by synchronizing all available maneuver and fire support assets. Commanders must ensure that coordination between aviation and ground units is continuous and detailed. This coordination precludes any possibility of being misunderstood or becoming disconnected during the battle. Table 3-3 lists some key requirements that must be coordinated among subordinate units to promote battlefield control.

(c) Attack helicopter units have numerous roles in covering force operations. They may be employed independent of ground maneuver units in deep attacks and against enemy second-echelon forces. They also may be integrated with the ground maneuver units during delay, defensive, and counterattack operations.

(d) To disrupt the enemy's attack schedule, the covering force commander often conducts simultaneous actions against first-echelon and follow-on enemy forces. The ATKHB can weaken, disrupt, and delay enemy second-echelon regiments while other units destroy the first echelon as illustrated in Figure 3-3. Actions against the second echelon are risky. When successful, however, they pay off in tremendous dividends. Such actions buy time, retain the initiative, and preserve the balance of power in close operations.

(e) As an integral part of the covering force mission, ground maneuver units often

conduct delay operations to slow the momentum of the attack. The covering force commander ensures that delaying units do not become so decisively engaged that they lose their freedom to maneuver. If they do, these units may be bypassed or encircled by the attacking force. To preclude these situations, the covering force commander interjects attack helicopter units into the battle at critical times. Their combat power distracts and disrupts the attack while ground units disengage and displace. In this mission profile, timing is critical. Therefore, premission planning should include reconnaissance of BPs. These positions should allow flanking engagements into the attack force. They also should provide clearly defined control measures; thus, events can take place in the proper sequence. For instance, the ground unit commander notifies the ATKHBs when the enemy reaches a designated PL. Then the battalion moves to a designated forward holding area. When the enemy reaches a second PL, the ground commander issues the battalion a prearranged signal. The battalion then moves its attack companies into previously selected BPs and provides maximum fires against the enemy's flanks.

Continuous attack method.

Phased attack method.

PL BLUE   PL RED

ENEMY FORCE

EA HIT

Maximum destruction method.
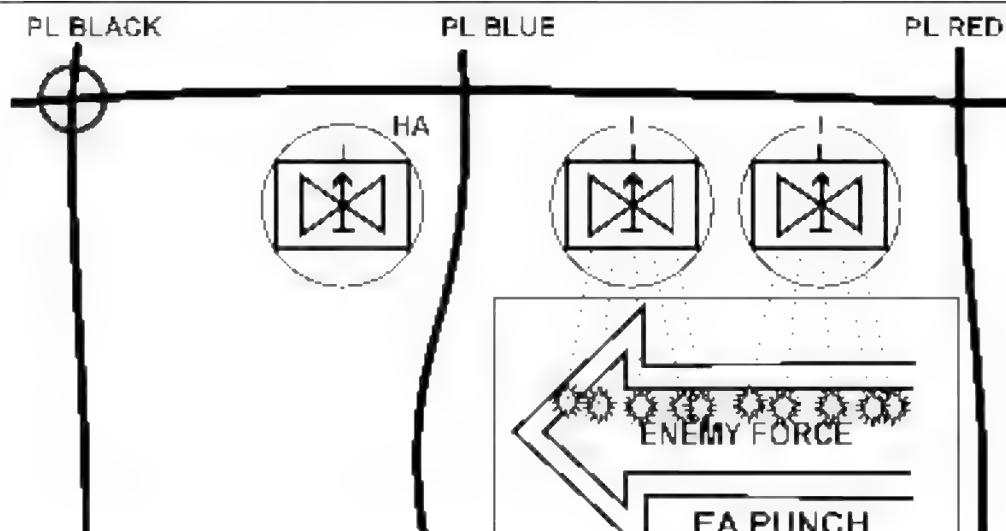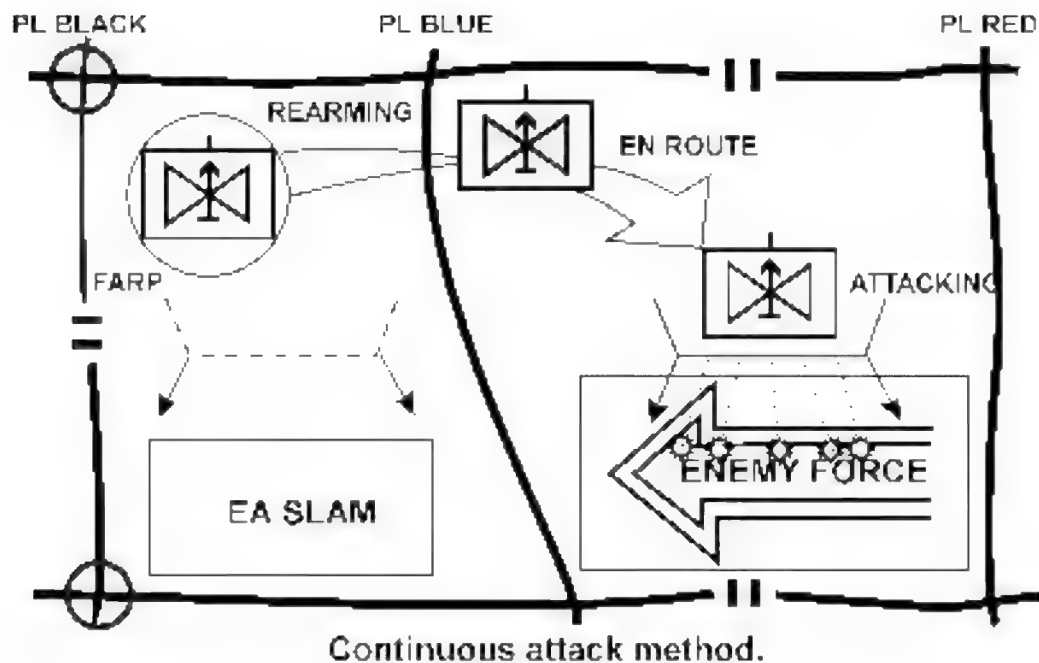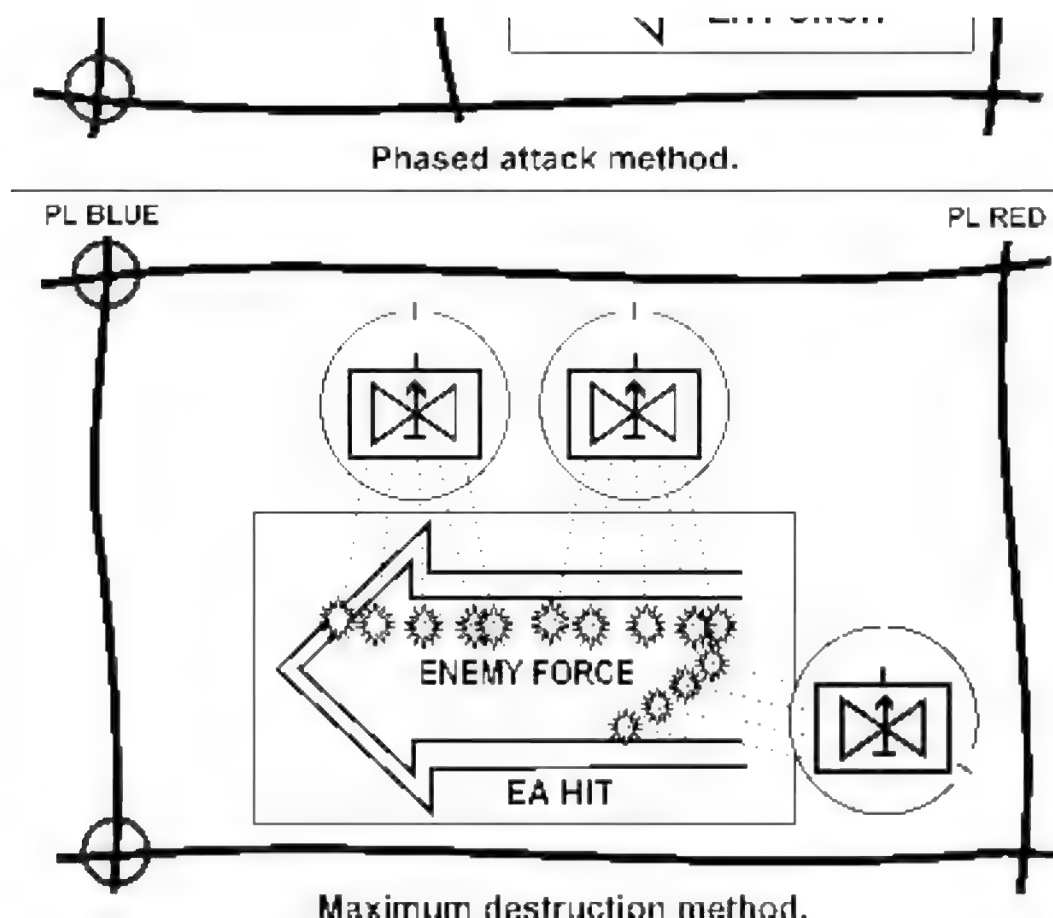
Figure 3-2. Possibilities for local counterattacks with aviation assets

Table 3-3. Required coordination between aviation and ground units

1. GENERAL
- Established liaison.
- Detailed premission planning.
- Joint reconnaissance.
- Contingency planning.

2. BATTLEFIELD
- Complementary initial and subsequent battle and attack positions.
- Fire distribution guidelines.
- Established target priorities.
- Locations of ground maneuver, FA, and AD units.
- Fire support priorities.
- Fire support and obstacle overlays.
- Maneuver scheme.
- Coordination for movement and fires across sector boundaries.
- Battlefield control measures.

- Attack and displacement signals.
- Airspace C^2.
- Use of laser designation systems.
- Common radio frequencies and signal operation instructions (SOI).
- Locations and methods for on-the-spot mission updates.

(f) Individual ground maneuver units may defend as part of the covering force mission to deny the enemy access along a specific avenue of approach. They also may defend when the momentum of the attack fades and the enemy first echelon can be stopped. Defensive operations generally are not static. Attack helicopter units require considerable maneuver space; therefore, they should never be confined to a static disposition within a defense plan. Instead, attack helicopters should capitalize on their unrestricted maneuver advantage over enemy ground forces. They could be employed in continuous attacks throughout the depth of the battlefield against the enemy's flank or rear units. They also could conduct spoiling attacks against enemy formations that have halted or have been slowed. Because attack helicopter units often operate forward of friendly ground units, direct and indirect fires must be coordinated. The coordination requirements presented in Table 3-3 should be addressed. Fire distribu- tion guidelines, FS priorities, and coordination for movement and fires across unit boundaries should be emphasized and coordinated. Figure 3-3 portrays the concept for ATKHB employment during defensive operations.
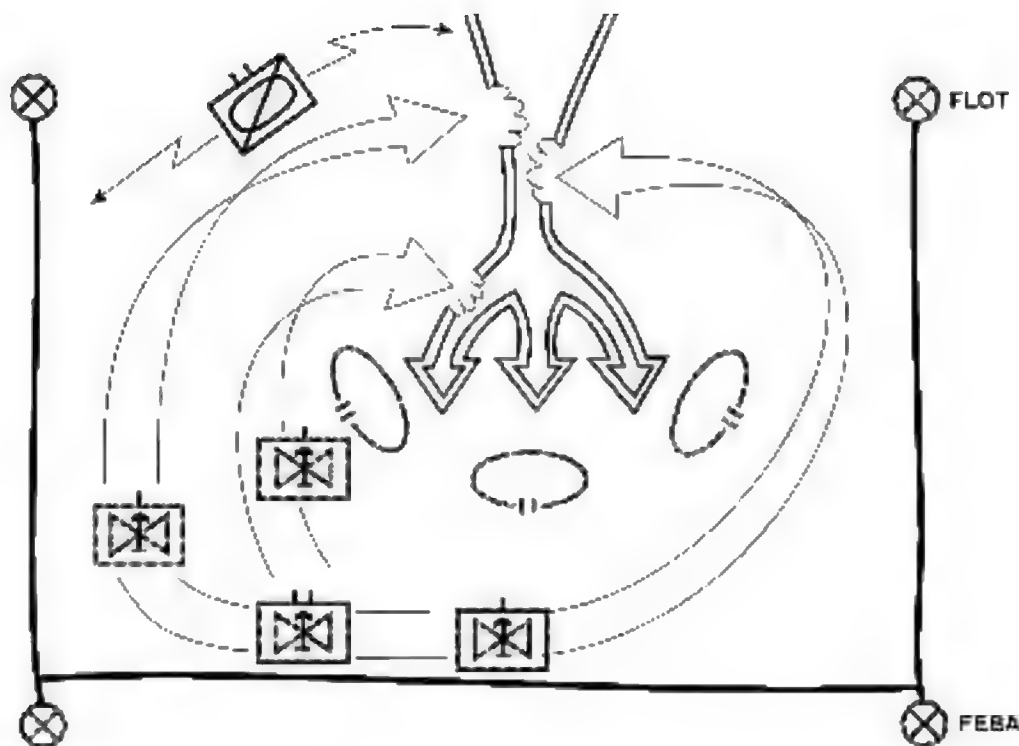
Figure 3-3. ATKHB employment during defensive operations

(g) The covering force should counterattack when the opportunity presents itself. Counterattacks in the security area should be short and violent. The objective is to destroy the enemy force before it can respond. In counterattack situations, attack helicopters usually are employed in large numbers to ensure fire superiority over the enemy at the critical point in the battle. They normally maneuver along different attack routes and should attack from a different direction than ground forces. (Figure 3-4 illustrates counterattacks in the security area; Figure 3-5 shows the employment of the attack helicopter battalion in the security area.)

COUNTERATTACK BY FIRE
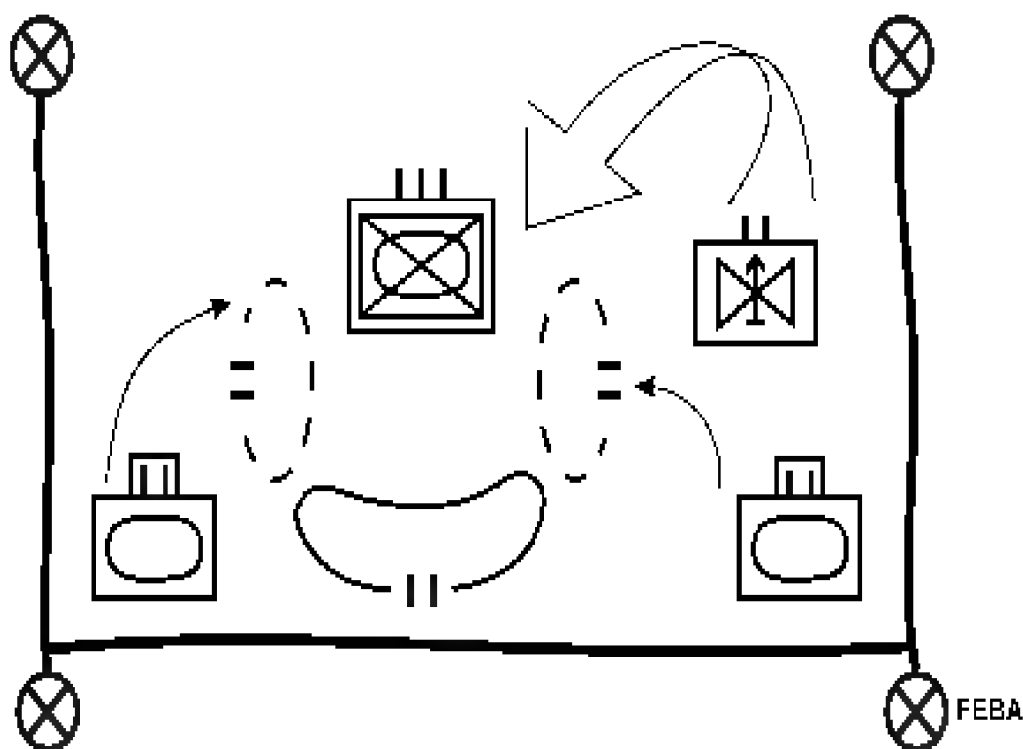
COUNTERATTACK BY MANEUVER

DOUBLE ENVELOPMENT AGAINST THE FLANK ⊗ FEBA ⊗ SINGLE ENVELOPMENT ⊗ FEBA
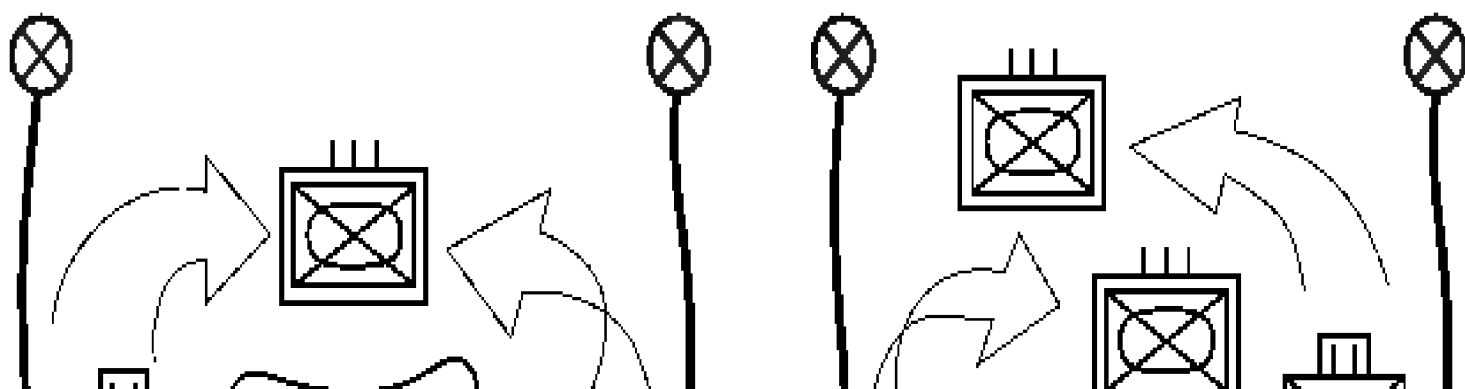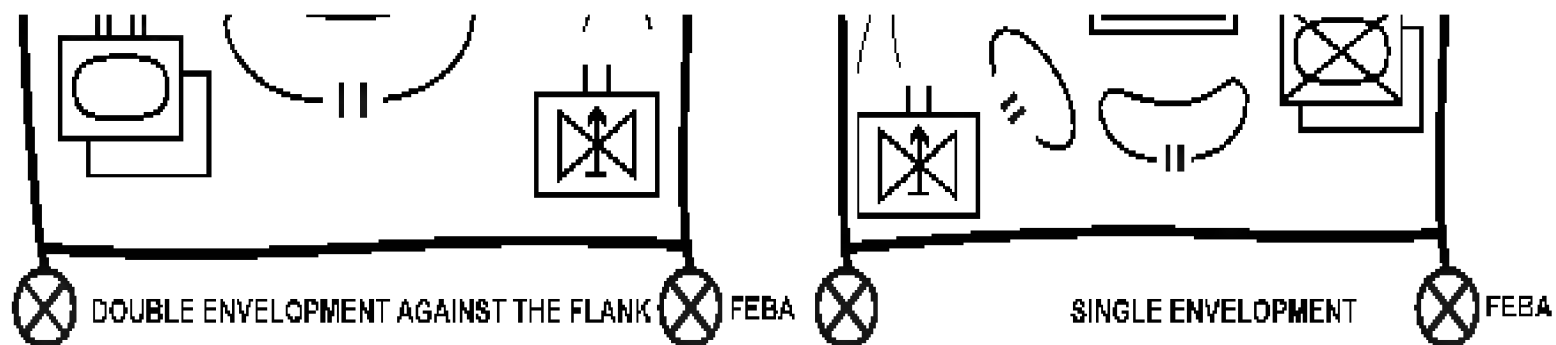
Figure 3-4. Local counterattacks in the security area

MAXIMUM DESTRUCTION

FARP

PHASED EMPLOYMENT

FARP
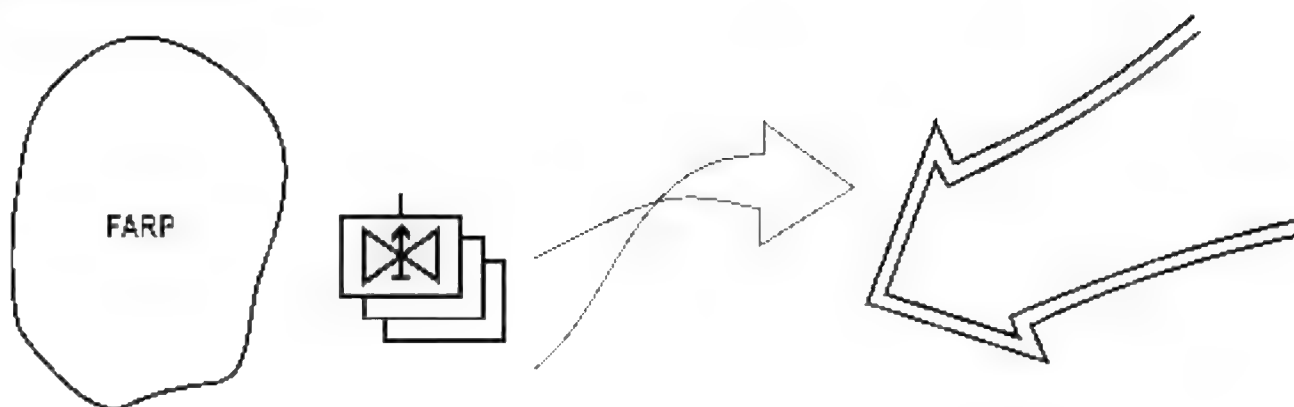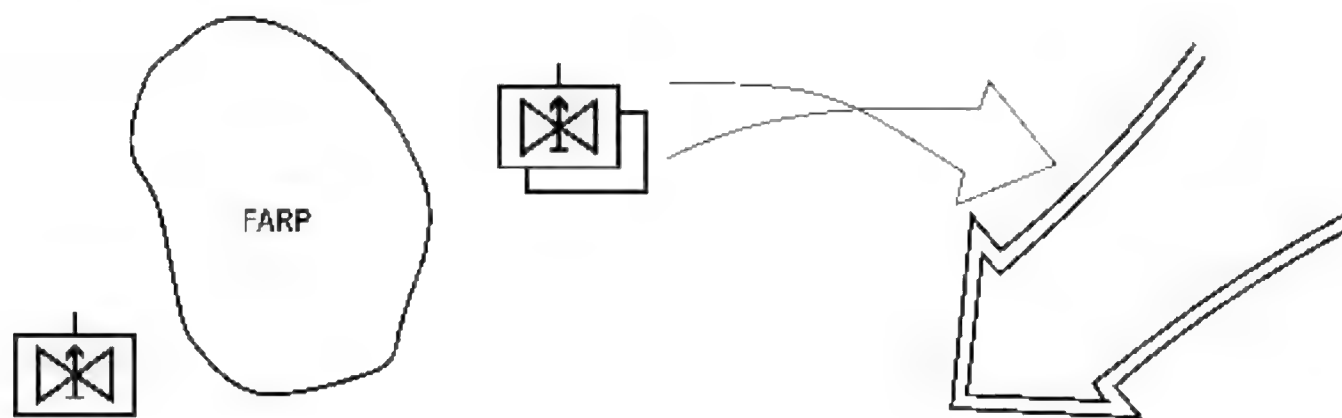
CONTINUOUS ATTACK
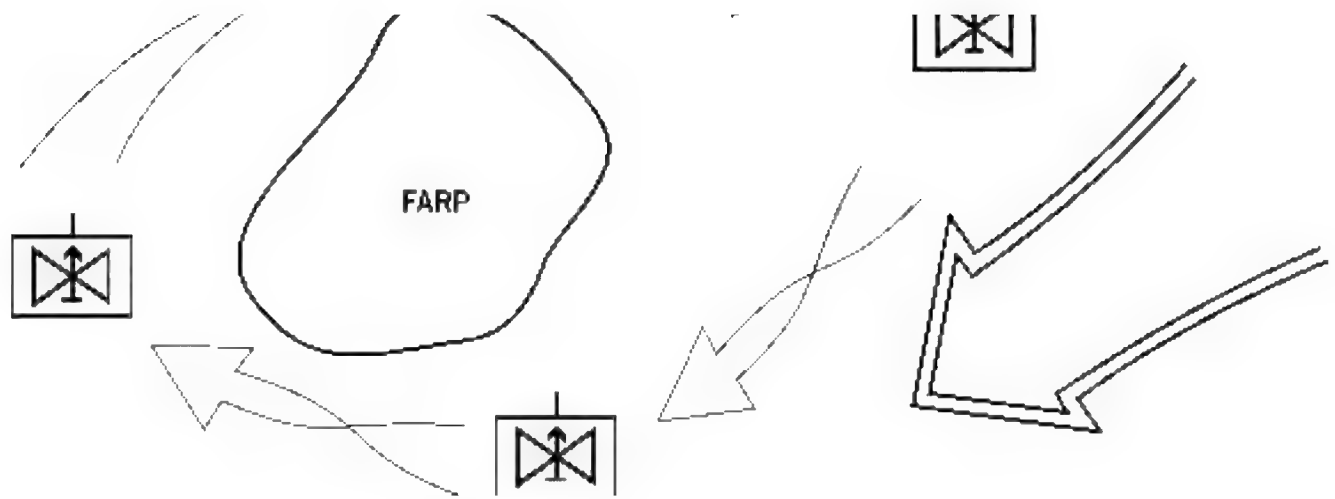
Figure 3-5. Employment of the attack helicopter battalion in the security area

(h) When planning CSS requirements, commanders must anticipate high consumption of Classes III and V to sustain ATKHBs. Ensuring that these items are sent forward to Class III supply points and ATPs close to the security area is critical. Also, the positioning of FARPs directly affects turnaround times and responsiveness to sustained operations. Another factor that may affect the employment of attack helicopters is imposed controlled supply rates. Control may be required because of limited supplies of rockets, antitank missiles, and other high-use munitions. Employment plans need to be flexible because this restraint may adversely alter the unit's capabilities.

(3) *Assault helicopter battalion (AHB) roles*. As part of the covering force mission, the AHB performs air assaults or emplaces ground forces into antiarmor ambush sites and forward operating bases (FOBs). It also anticipates extensive support missions to assist in battlefield preparation and sustainment. The AHB transports barrier materials, supplies, and equipment to forward units and constantly repositions FARPs and resupplies them with Classes III and V. AHB assets may also evacuate wounded personnel and transport replacements forward if other divisional assets cannot meet battlefield requirements.

(4) *General support battalion (GSAB)/Medium-lift roles*. During covering force operations, the GSB will execute the same missions as the assault battalion as well as airborne C^2. Brigades with CH-47 Chinook battalions have an even more robust capability to move troops, combat systems, and supplies. If the division's MEDEVAC capability gets stretched too thin, one CH-47 can carry 24 litter patients to support mass CASEVAC.

3-33. DIVISION (OFFENSE) COVERING FORCE

The aviation brigade also may conduct a covering force operation during an offensive operation such as a movement to contact. Movement to contact gains or reestablishes contact with the enemy. It develops the situation early and results in an advantage before the decisive engagement. This operation is characterized by decentralized control and rapid commitment of forces. It terminates when enemy resistance requires the deployment and coordinated effort of the division.

During a movement to contact, the division normally is configured with a covering force, an advance guard, flank and rear guards, and the main body as depicted in Figure 3-6. Each of these elements performs a distinct mission to support the movement to contact.
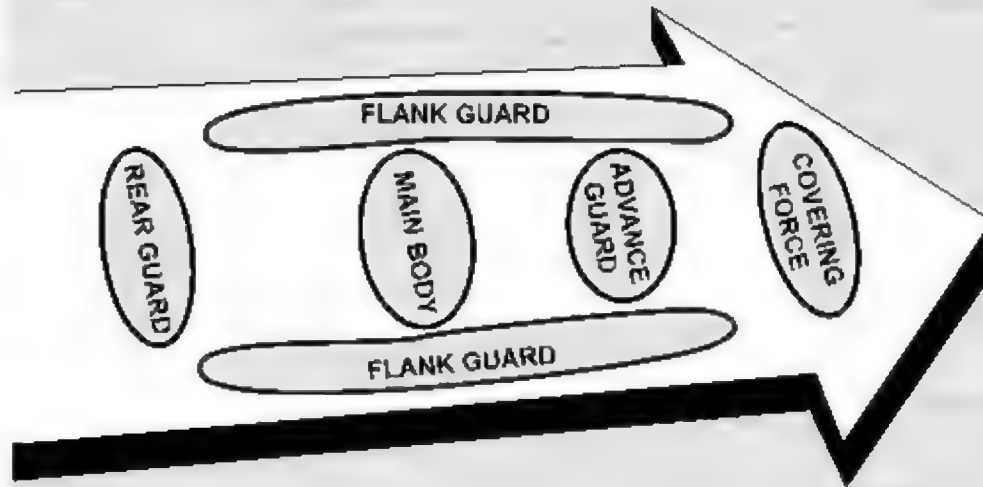
Figure 3-6. Organization for movement to contact

a. *Aviation brigade missions.* During a movement to contact, this brigade can execute several missions at the same time to support division operations. Within light divisions, the brigade may normally be designated as the controlling headquarters for either the covering force or the advance guard.

(1) When supporting the division, the brigade employs its subordinate assets to enhance and extend division capabilities. As depicted in Figure 3-7, the cavalry and air reconnaissance squadrons may take part in the covering force to conduct screening operations. At the same time, the ATKHBs positioned in forward AAs are ready to react to enemy contact initiated by the covering force or advance guard. Also, the AHC helps displace FARPs forward and is prepared to accept on-order missions to conduct air assault operations when task-organized. In this situation, the aviation brigade commander must control his assets closely to respond in a timely manner to contingencies that may develop.
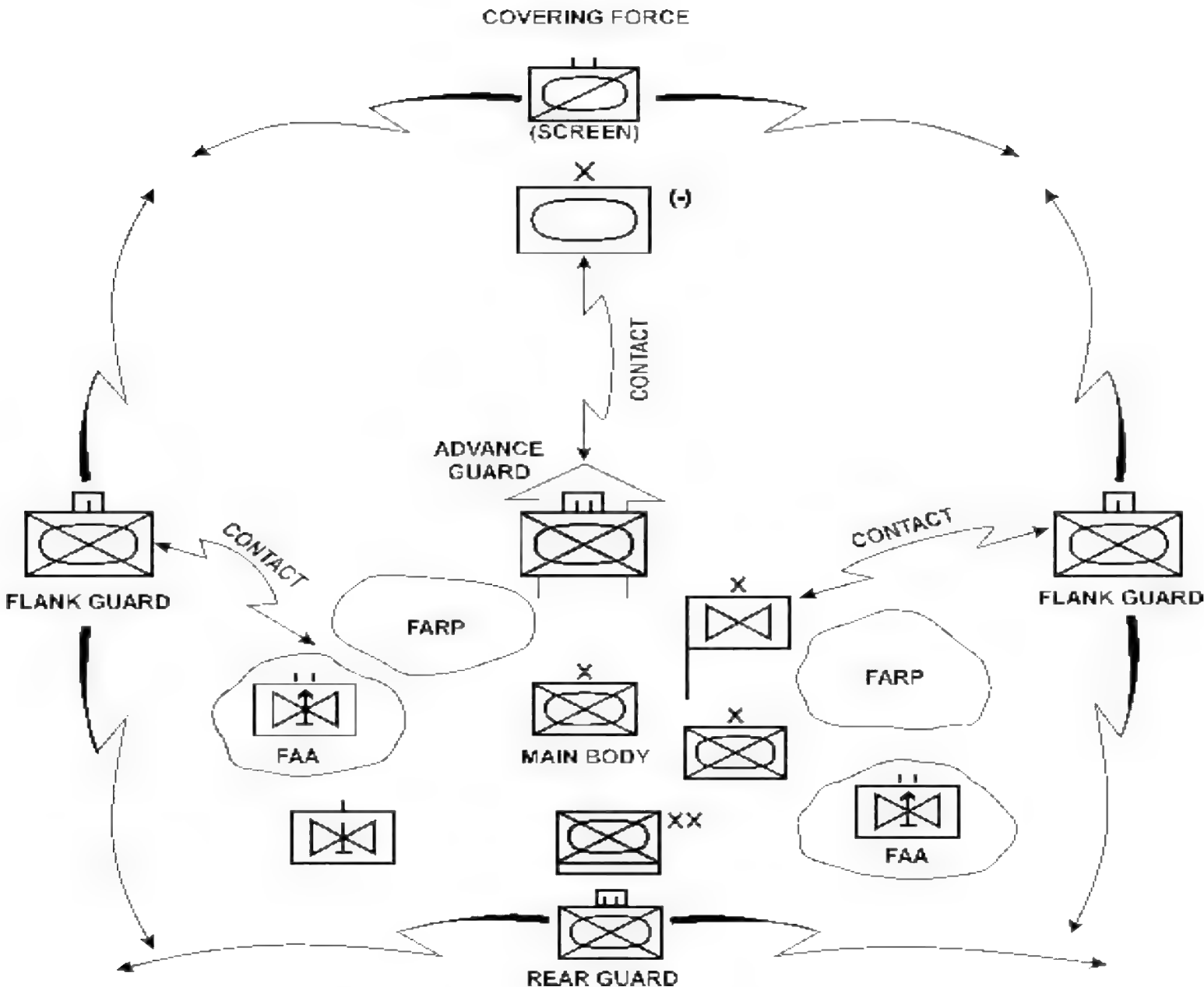
COVERING FORCE

Figure 3-7. Aviation brigade in division movement to contact

(2) As the controlling headquarters for the covering force, the aviation brigade must be augmented with additional ground maneuver forces and receives CS and CSS assets in direct support. Figure 3-8 shows possible locations for maneuver elements under aviation brigade control. The cavalry squadron provides reconnaissance, initiates contact with the enemy, and develops the situation. As ground TFs maneuver to engage enemy forces, ATKHBs can respond by providing firepower to the ground maneuver commander. The AHC performs missions to sustain the movement of the force.
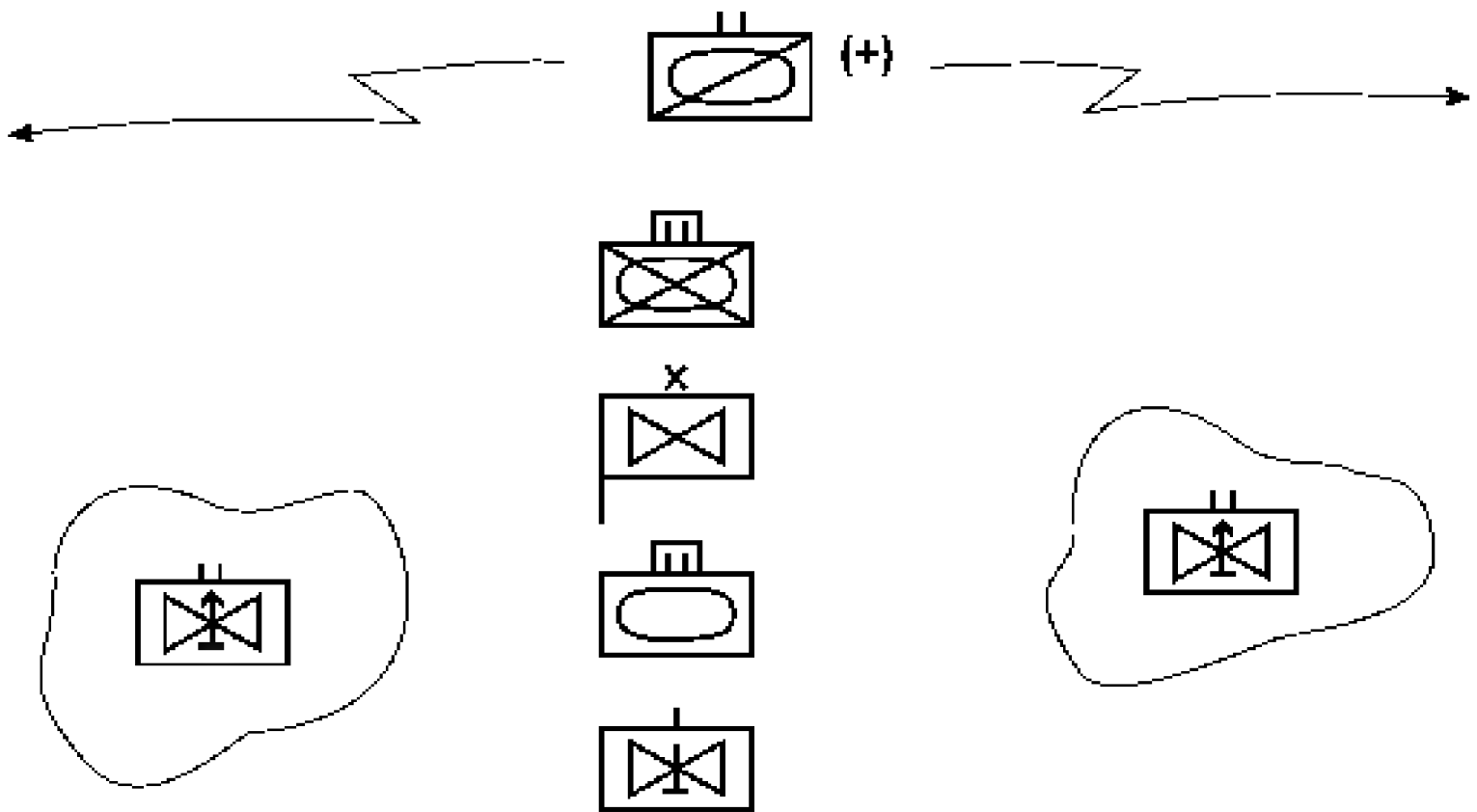
NOTE: The AHC moves FARPs forward as movement to contact advances

Figure 3-8. Aviation brigade task-organized with ground maneuver forces in movement to contact

b. *Cavalry and Air Reconnaissance Squadron Roles.* The major roles of the squadrons are reconnaissance and screening operations.

c. *Ground Maneuver Battalion Roles.* Ground maneuver battalions must augment the aviation brigade in covering force operations. Their additional maneuver capability maintains the momentum of the movement to contact. These battalions follow cavalry or air reconnaissance forces. Once the cavalry has established initial contact with the enemy, battalions attack to penetrate and destroy the enemy's forward defenses.

d. *Attack Helicopter Battalion (ATKHB) Roles.*

(1) The ATKHBs give the aviation brigade the necessary organic combat power to engage, fix, and destroy the enemy. Their ability to move rapidly and mass firepower at the decisive place and time gives the task force commander a formidable unit to seize, retain, and exploit the initiative.

(2) During a movement to contact, attack helicopters are critical to the success of advance forces and the main body. As the covering force encounters enemy formations, attack helicopters move forward to engage them. These helicopters can strike deep to attack enemy forces as they reposition in response to covering force actions. They can also assist ground forces in bypassing enemy positions. With the mobility and firepower

of these battalions, the TF commander can often overwhelm the enemy and seize the initiative without marshaling ground forces to attack. Also, attack helicopters may augment the reconnaissance and screening capability of the cavalry and air reconnaissance squadrons.

(3) The availability and responsiveness of ATKHBs are key factors in their employment. However, the battalions cannot be expected to maintain continuous overwatch while awaiting the employment of ground maneuver forces. They normally operate from successive FAAs. FM 1-112 gives specific information on the tactical employment of ATKHBs to support a ground maneuver unit.

e. *Assault helicopter battalion (AHB)/Utility Roles.* The AHB/GSAB role in a movement to contact is critical to sustaining the entire operation. To avoid overcommiting the AHB/GSAB, additional assets may be requested from the corps aviation brigade to augment the AHB/GSAB mission. The AHB/GSAB moves personnel, supplies, and equipment rapidly throughout the battlefield to support the operation. The battalion could be used for the movement of fuel and ammunition so that the aviation brigade's other air assets can continue to move or the battalion could conduct air assault operations with ground troops to seize terrain that is critical to ground forces or block the movement and withdrawal of the enemy.

SECTION XI. Offensive Operations

The aviation brigade is employed offensively during the force commander's offensive or defensive scheme of maneuver. The aviation brigade or subordinate elements may participate in all or a portion of offensive operations-movement to contact, hasty and deliberate attacks, exploitation, and pursuit.

3-34. MOVEMENT TO CONTACT

a. During a movement to contact, the aviation brigade can simultaneously execute several missions to support division operations. In some cases, it may be designated as the controlling headquarters for either the covering force or the advance guard. When supporting the division's scheme of maneuver during a movement to contact, the brigade employs its subordinate assets to enhance and extend division capabilities. The cavalry squadron often participates in the covering force. At the same time, the ATKHBs are positioned in forward AAs as a tactical reserve. They will react to enemy contact initiated by the squadron or the division's advance guard. Also, the assault helicopter company helps displace FARPs forward. It is prepared to accept on-order missions to conduct air assault operations. As the controlling headquarters for the covering force or the advance guard, the aviation brigade should be augmented with additional ground maneuver forces. The brigade can receive CS assets in direct support.

b. The aviation brigade conducts movement to contact to gain or regain ground contact with an enemy force. Terrain reconnaissance is required to execute this mission but only in an effort to find the enemy. The movement to contact terminates when the the unit reaches the objective or limit of advance without enemy contact or upon contact with an enemy force. During the movement to contact, these critical tasks must be accomplished unless the higher

commander directs otherwise-

(1) Reconnoiter and determine the trafficability of all high-speed routes within the zone.

(2) Inspect and classify all bridges, culverts, overpasses, and underpasses along high-speed routes.

(3) Identify all bypasses and fords that cannot support heavy rapid movement.

(4) Clear all high-speed routes of mines and obstacles withinits capability or locate bypasses.

(5) Find and report all enemy forces within the zone and determine their size, composition, and activity.

c. Although a movement to contact is similar to a zone reconnaissance, there are a few additional considerations. They are-

(1) The zone should be narrower to allow the commander to better concentrate his combat power.

(2) The unit gains contact with the smallest unit possible and quickly executes actions on contact to prevent the unnecessary deployment of larger forces.

(3) Speed increases risk. A thorough IPB is required to show which areas can be moved through quickly and which areas require more deliberate movement.

(4) NBC reconnaissance elements and engineers are well forward to recon known or suspected contaminated areas and help negotiate obstacles which allows troops to bypass and continue movement.

(5) Air cavalry moves forward of ground forces and screens along exposed flanks to help speed the movement.

(6) CSS assets are tailored to the mission and move with the combat trains. Prepackaged logistics packages (LOGPACs) heavy on class III and V are included.

3-35. HASTY ATTACK

The hasty attack is an offensive operation. It usually evolves from a movement to contact or proceeds from successful defensive operations. It also may develop from modifying a preplanned counterattack operation or from continuing beyond the objective of a deliberate attack. Seizing and retaining the initiative over the enemy is the purpose of a hasty attack despite its origin. Violent, aggressive action characterizes a hasty attack, which must be executed in minimal time. The principles of attack-***concentration***, ***surprise***, ***speed***, ***flexibility***, and ***audacity***-apply in a hasty attack as in other offensive operations. Throughout all operations, commanders must constantly seek opportunities to attack. They must determine quickly if the enemy can be defeated by hasty attack and, if so, execute the operation rapidly. Hesitation on the part of the commander may cause his forces to lose momentum, allowing the enemy to regroup and regain the initiative.

a. *Aviation Brigade Missions.* Aviation brigade elements often take part in the hasty attack to support division operations.

(1) The brigade may conduct hasty attacks as a maneuver force headquarters, either designated as an aviation brigade or task-organized with additional ground maneuver forces. Figures 3-9 through 3-11 show examples of these employment situations.

(2) To execute a hasty attack rapidly and decisively, leaders need a simple scheme of maneuver and effective SOPs and battle drills. They must react quickly so that the initiative and opportunity are not lost.

b. *Cavalry Squadron Roles.* Primarily because of their reconnaissance mission, the cavalry squadrons forces normally will be the first forces of the division to locate and establish contact with the enemy.

OBJECTIVE

OBJECTIVE

OBJECTIVE

AB ✕ 1

1 ✕ 3

MAIN ATTACK

SUPPORTING ATTACK

(-)
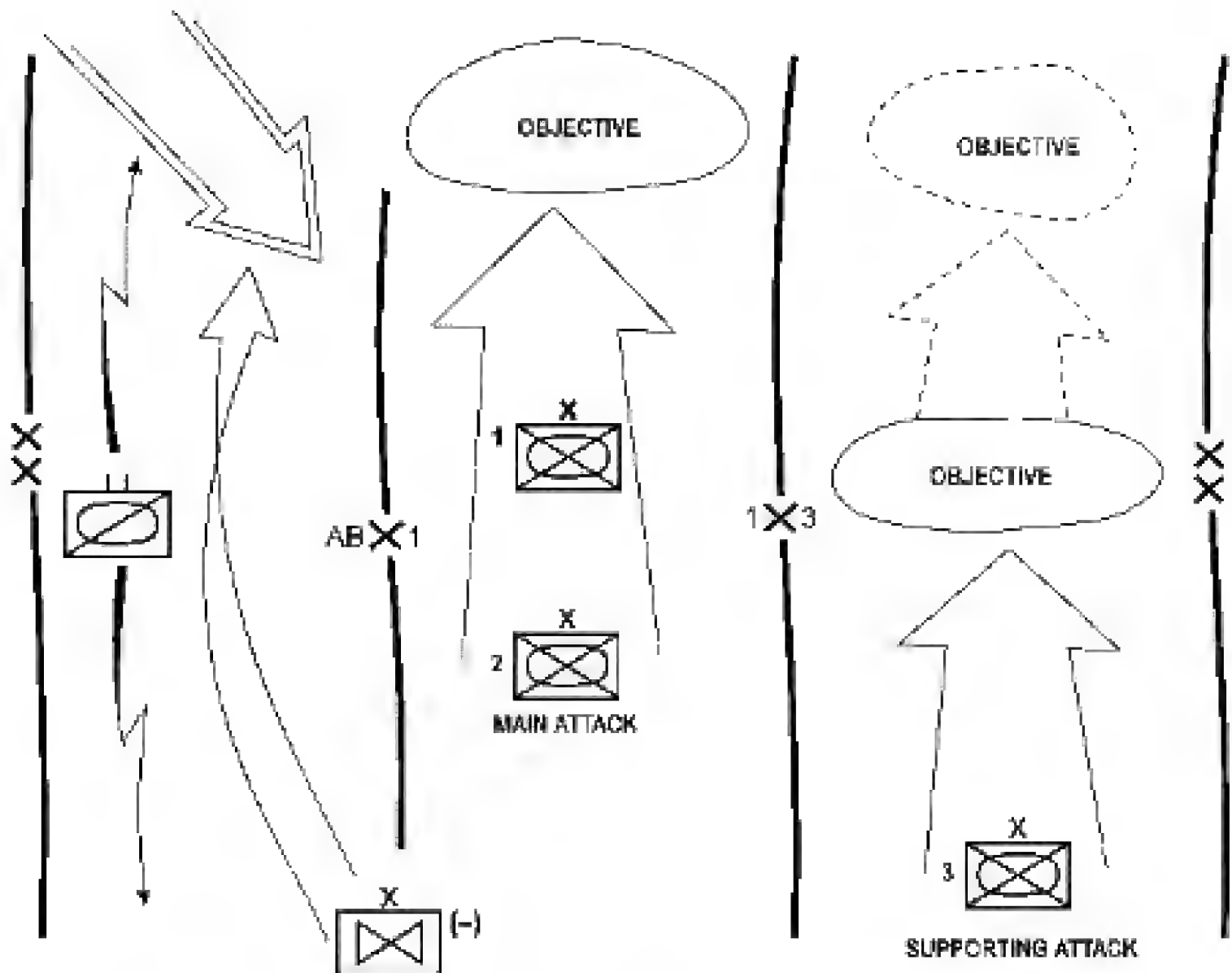
NOTES:

1. Division main attack penetrates enemy defenses.

2. Aviation brigade is employed as a maneuver force to blunt enemy counterattack.

3. Cavalry squadron is employed to screen the division flank to provide security, as the enemy formation is attacked by both ATKHBs.

4. AHC repositions FARPs to support the attack.

Figure 3-9. Aviation brigade assets participating in a division hasty attack

OBJECTIVE

OBJECTIVE

OBJECTIVE

(−)

1 SUPPORTING ATTACK

3 MAIN ATTACK

(OPCON)

(OPCON)
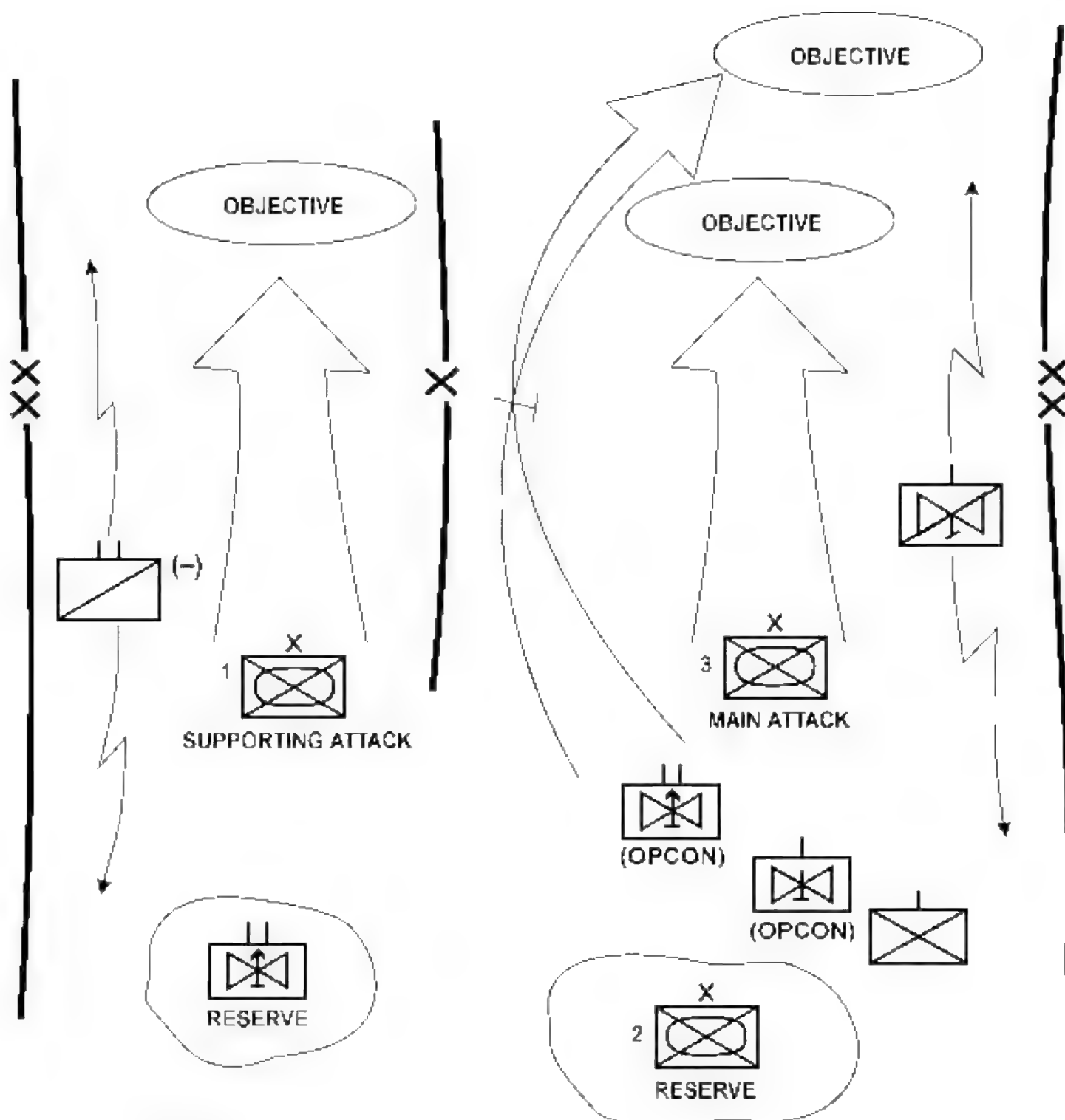
RESERVE

2 RESERVE

NOTES:

1. Cavalry squadron screens flanks..

2. ATKHB and AHC conduct air assault under OPCON of ground brigade.

3. ATKHB is reserve.

Figure 3-10. Aviation brigade in a hasty attack as a maneuver force

MAIN BODY
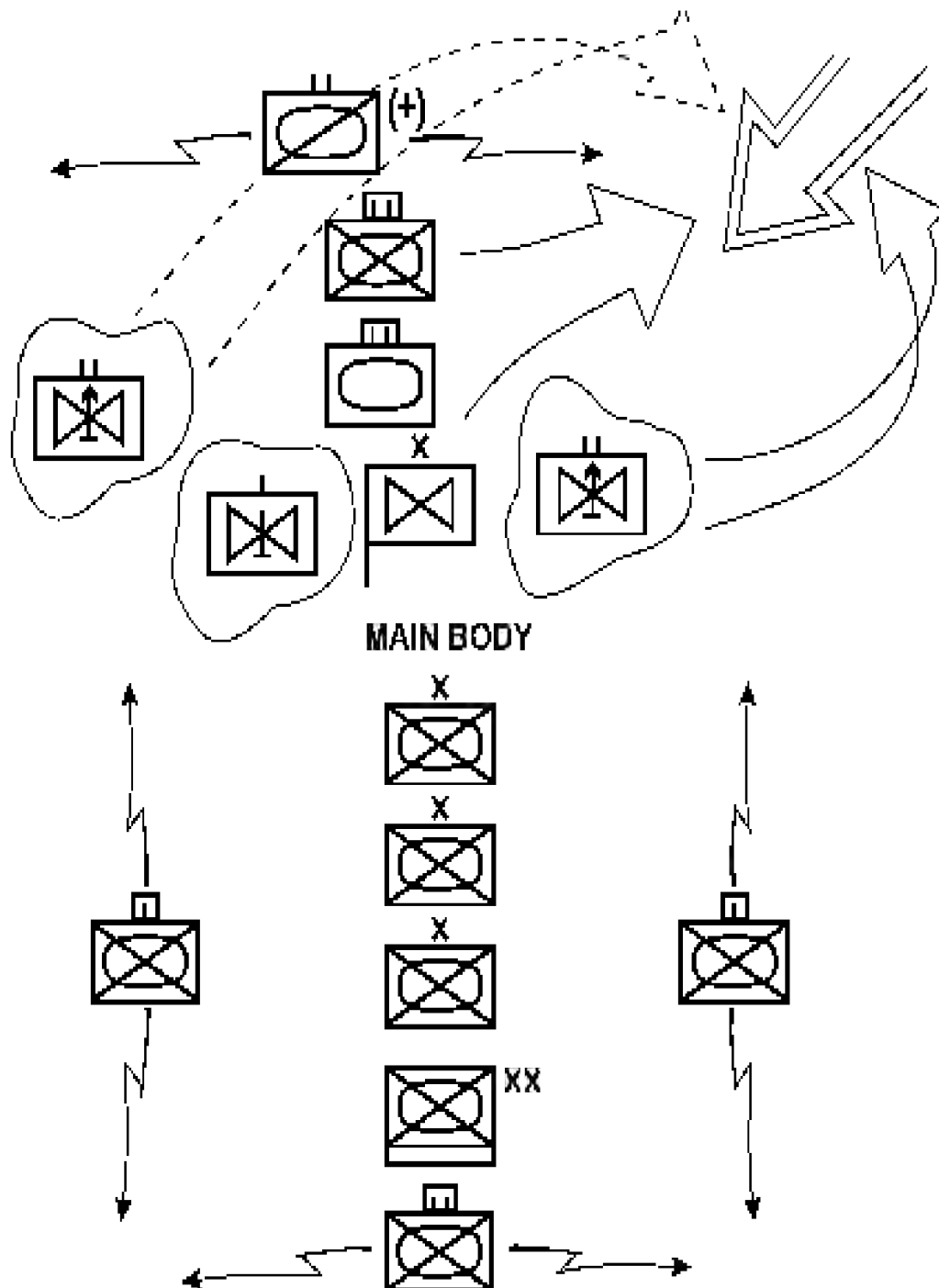
NOTES:

1. Division conducts a movement to contact with the aviation brigade controlling forward elements.

2. Covering force makes contact with moving enemy force.

3. Aviation brigade attacks enemy formation with an ATKHB as ground task forces deploy to develop the situation.

4. Second ATKHB is prepare to reforce the attack on order.

Figure 3-11. Aviation brigade in a hasty attack as a maneuver force augmented with additional ground maneuver forces

c. *Attack Helicopter Battalion (ATKHB) Roles.* In the hasty attack, attack helicopters can shock and overwhelm enemy forces with their speed and firepower; then they can seize the initiative. They are best employed against moving, massed mechanized or armor enemy forces. Figure 3-12 depicts an ATKHB attacking enemy forces moving to reinforce a position under attack. In other missions, the ATKHB-

(1) Attacks enemy counterattacking forces.

(2) Provides immediate antiarmor firepower.

(3) Attacks withdrawing or moving enemy forces.

(4) Attacks bypassed units or pockets of resistance.

(5) Attacks enemy uncommitted reserves, C^2 nodes, and support facilities.

(6) Screens forward or to the flanks of an attacking force.

(7) Conducts air combat.

d. *AHB/Utility Roles.* Helicopters carrying air assault forces form a combat maneuver force that can conduct a hasty attack. This force can seize key terrain to block enemy movement, reinforce a weakened sector, or exploit a tactical advantage gained by attacking forces. AHB assets can also place forces in the enemy's rear to disrupt it's maneuver potential and make it fight in two directions at once.
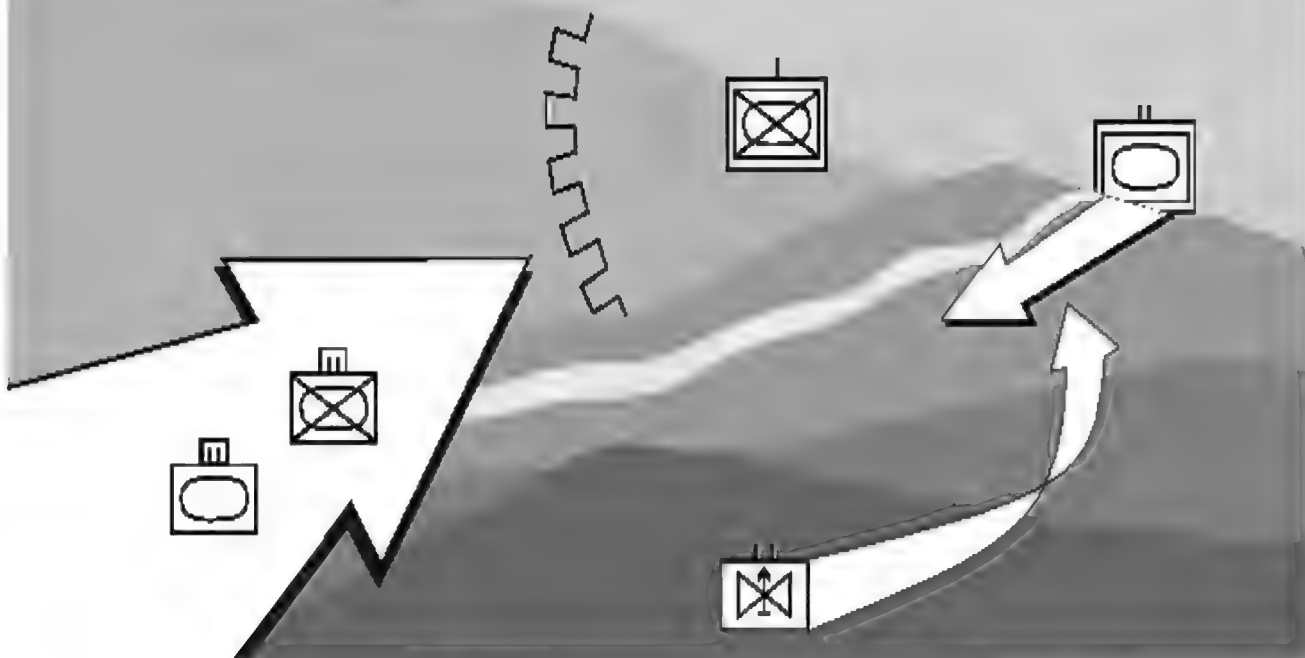
Figure 3-12. Attack helicopter battalion in a hasty attack

3-36. DELIBERATE ATTACK

a. *Purpose.* A deliberate attack becomes necessary when enemy forces cannot be defeated by a hasty attack or cannot be turned or bypassed. It also is necessary to secure key terrain or destroy substantial enemy forces.

> **(1)** Commanders and staffs must plan, coordinate, and synchronize every phase of a deliberate attack. They gather detailed intelligence from all available sources to determine the actual disposition and capabilities of the enemy. Before attacking, leaders ensure that thorough reconnaissance, target acquisition and development, and a detailed analysis of all related factors have been completed. The success of a deliberate attack requires positive, aggressive leadership at all levels of command. Combat power must be rapidly concentrated to exploit the enemy's weaknesses and the attack must be violently executed.

> **(2)** A deliberate attack is expensive in terms of manpower, equipment, supplies, and time. Such an attack requires detailed planning and the assets to execute the operation. When friendly forces are on the move, a deliberate attack is the least desirable method of attack. It often may lead to loss of momentum; thus, the enemy may be able to react, regroup, and reinforce its positions. Therefore, the movement to contact and the hasty attack are preferred over the deliberate attack.

b. *Aviation Brigade Missions.* The aviation brigade conducts deliberate attack missions in deep, close, or rear operations areas. If attacking heavily fortified positions, it must be augmented with additional ground maneuver forces.

(1) The roles of the aviation brigade units during a deliberate attack differ little from those during a hasty attack. The main difference is the amount of coordination, synchronization, and preparation that takes place before the attack.

(2) During deliberate attack operations, the cavalry or air reconnaissance squadron performs reconnaissance and screening for the attacking force. The ATKHBs then envelop enemy positions and strike moving enemy reserve formations. Simultaneously, ground maneuver forces assault and break through the more heavily fortified positions. The AHC may be task-organized with infantry to conduct air assaults for blocking enemy withdrawal routes or securing objectives.

c. *Cavalry Squadron Roles.* The squadron conducts continuous reconnaissance operations before and during the deliberate attack. These operations provide real-time intelligence for planners and attackers. During the attack, the squadron may screen the maneuvering force from surprise as it moves to the objective as shown in Figure 3-13. In the deliberate attack, the cavalry or air reconnaissance squadron-

(1) Provides limited security for maneuvering forces.

(2) Conducts feints and demonstrations to deceive the enemy.

(3) When an enemy force weakens and exploitation is about to begin, the squadron locates enemy egress routes and disrupts withdrawal of enemy forces.

(4) Reconnoiters for vulnerabilities in the enemy defense.

(5) Locates enemy C^2 elements, logistics facilities, and reserve forces.

(6) Conducts delay operations, with augmentation, to allow massing of forces for the attack.

(7) Provides rear area security.

(8) Secures lines of communication.

d. *ATKHB roles.* Attack helicopter battalions are part of the scheme of maneuver in the deliberate attack. These battalions provide mobile and flexible combat capability. They are least effective against heavily fortified positions and they cannot seize and hold terrain. They are best suited for attacking massed, moving enemy armored formations. In the deliberate attack, ATKHBs can-

(1) Attack to exploit initial successes.

(2) Attack withdrawing enemy forces or moving enemy reserves.

(3) Conduct independent deep attacks to destroy enemy C^2 elements, logistics facilities, and maneuver forces or to participate in a scheme of maneuver in close or deep operations.

e. *AHB/GSAB roles.* AHB/GSAB assets move combat troops and equipment into the fight or they move equipment and supplies to sustain the fight. With these assets, a nonmechanized AATF can stay in the fight. The AHB/GSAB is ideal for increasing the mobility of the attacking forces and for accelerating combat tempo as the fight moves to the exploitation phase.
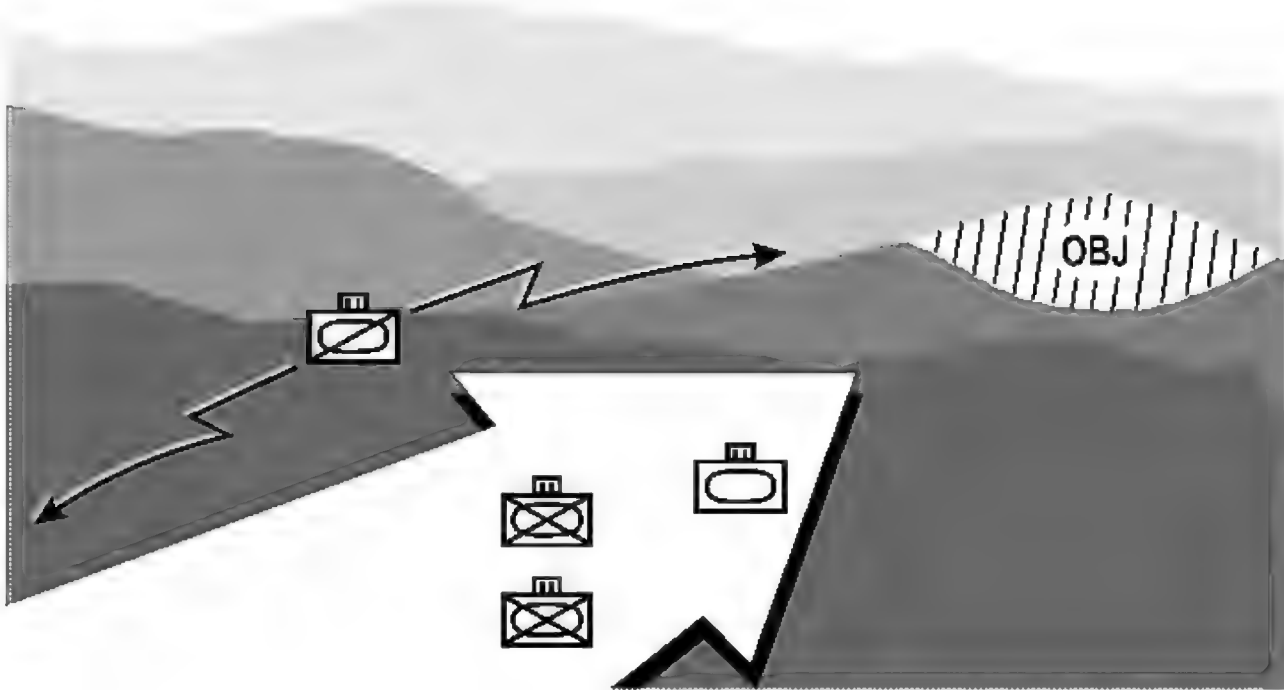
Figure 3-13. Cavalry or air reconnaissance squadron screening during deliberate attack

3-37. EXPLOITATION

a. *Purpose.*

(1) Exploitation takes immediate advantage of a newly created or discovered enemy weakness. The objective is to strike swiftly and deeply into the enemy's defense and destroy its ability to conduct an orderly withdrawal. The exploitation is initiated when the enemy cannot maintain its defenses. The enemy's vulnerability to exploitation is indicated by the-

(a) Increase in abandoned material.

(b) General decrease in enemy resistance.

. **(c)** Increase in the number of prisoners being captured.

(d) Overruns of the enemy's artillery positions, CPs, signal installations, supply dumps, and supporting units.

(2) Exploitation is an opportunity to make gains well beyond those dictated by normal force ratios. In just a few days, more gains can be made than in months of other

operations. Exploitation forces should be large and reasonably self-sufficient. They should be well supported and have the flexibility to change direction on short notice. They must be at least as mobile as the exploited force.

(3) Exploitation begins with forces maneuvering deep to continue the momentum of the attack. As the battle progresses, commanders normally will designate exploiting forces by issuing FRAGOs during the attack. An objective is assigned to the exploiting force. The objective will be one that, if captured or destroyed, will contribute significantly to destroying organized enemy resistance.

b. *Aviation Brigade Missions*. The aviation brigade is an ideal exploitation force; it is well suited to the fast tempo of this operation. The brigade can easily maneuver to outflank or cut off enemy forces, fixing them so that they can be destroyed. During an exploitation, the brigade will capitalize on early success, maintain the momentum of the operation, and keep the enemy off balance. It must maintain continuous pressure against enemy forces to prevent them from reorganizing their forces and especially from reinforcing their defenses. Destroying C^2 facilities, cutting lines of communication, and destroying the logistic capability will be primary missions. Figure 3-14 shows the aviation brigade in exploitation.

c. *Cavalry Squadron Roles*. The squadron provides reconnaissance and screens for the exploiting force. It conducts reconnaissance to assist the force in maintaining rapid and continuous momentum. As contact continues with the enemy, the squadron reconnoiters the enemy's rear area to locate enemy forces and targets.

d. *ATKHB Roles*. ATKHBs strike the enemy in rear areas and flanks to disrupt its withdrawal or reorganization as exploiting ground maneuver forces continue to attack. As they maneuver against the enemy, the ATKHBs can destroy maneuver and fire support forces, C^2 facilities, and logistics installations and can counter threat helicopters.

e. *AHB/GSAB Roles*. The AHB/GSAB rapidly moves troops, equipment, and supplies forward to maintain the momentum. When combined with infantry as an AATF, the AHB/GSAB seizes key terrain, crosses obstacles, and otherwise uses it's mobility to block and cut off disorganized enemy elements.
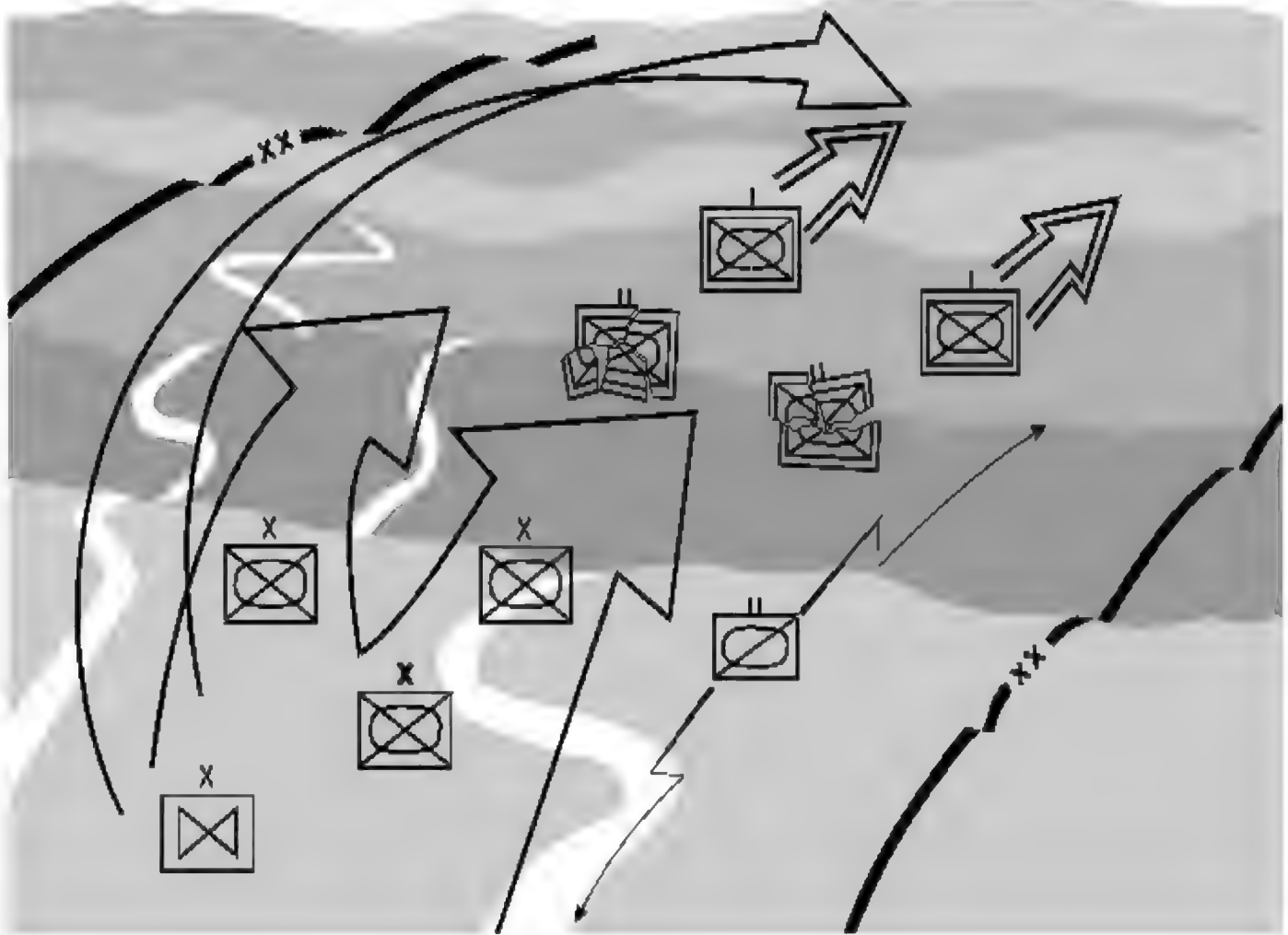
Figure 3-14. Aviation brigade in exploitation

3-38. PURSUIT

a. *Purpose.* As the enemy begins to lose its ability to defend or delay and attempts to disengage and withdraw, exploitation may develop into pursuit. The main purpose of pursuit is to destroy the enemy force completely. Success during pursuit requires unrelenting pressure against the enemy to prevent it from reorganizing and preparing defenses. Despite the lack of time for planning and coordination, the transition to the pursuit must be rapid. Commanders of all units in exploitation must anticipate the transition to pursuit and continually consider new courses of action. Two separate forces are designated for a pursuit.

    (1) *Direct pressure force.* The first force is a direct pressure force. It conducts a series of hasty attacks to maintain forward momentum and to cause maximum casualties. Preferably, armor-heavy forces would continue day and night with unrelenting violence.

    (2) *Encircling force.* The second force is an encircling force that moves swiftly to cut off the retreating enemy. The encircling force must be at least as mobile as the enemy. The force advances along routes parallel to the enemy's line of retreat to reach key road intersections, bridges, and mountain passes ahead of the enemy. The force then establishes strong blocking positions to cut off the enemy's escape routes. The ATKHBs

are ideal flanking or encircling forces.

b. *Aviation Brigade Missions*. The aviation brigade can play a major role in the pursuit. As part of the direct pressure force, aviation brigades conduct reconnaisance, perform security operations, and conduct attacks to destroy the enemy. As part of the encircling force, the brigade can outflank the retreating enemy with attacks or air assaults to fix, block, and ultimately destroy its forces. Figure 3-15 depicts the aviation brigade in pursuit.

c. *Cavalry Squadron Roles.* The squadron can screen for the direct pressure and encircling forces as they advance in the pursuit. Air assets are best employed to operate on the deep axis of advance in reconnoitering the withdrawing enemy to determine its retreat routes, egress routes, and location. Ground cavalry may operate more efficiently with the slower moving, direct pressure force by conducting screen operations to warn of enemy reinforcements or flanking actions. The squadron is not normally fragmented. However, this particular role is one technique for its employment.
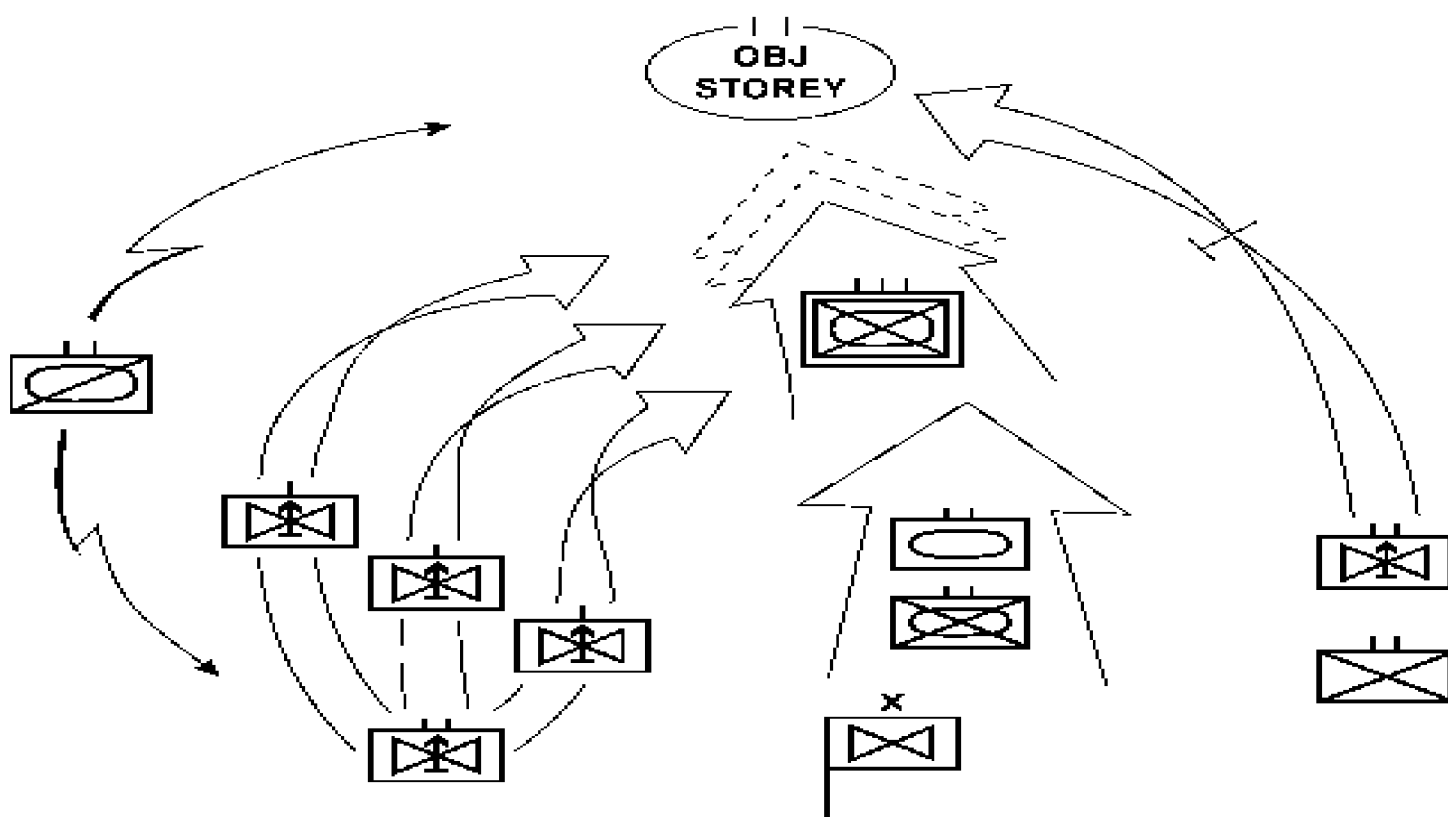
Figure 3-15. Aviation brigade in pursuit

d. *ATKHB Roles.* The ATKHB maneuvers deep to outflank and contain retreating enemy forces. Repeated attacks by the ATKHB will speed the disintegration of the enemy's ability to delay. As the attacks continue, attack helicopters can take the lead in blocking and defeating any breakout attack by the enemy.

e. *AHB/GSAB Roles.* The AHB/GSAB provides assets to sustain the pursuit. It also provides maneuver capability to promote the destruction of the enemy. Its assets can be used primarily

in two ways. First, AHB/GSAB assets rapidly move equipment and supplies forward to replenish critical shortages. This mission may become essential to sustain momentum. Second, AHB/GSAB assets maneuver air assault forces to fight the battle and outdistance the enemy to block its withdrawal. Air assault forces quickly seize key terrain features, such as bridges, so that pursuit forces can advance rapidly.

SECTION XII. Defensive Operations

The aviation brigade performs two types of defensive operations. They are mobile defense and area defense.

3-39. MOBILE DEFENSE

Mobile defense is force oriented. It is used to defeat or destroy enemy forces without regard for holding specific terrain. It is primarily used when friendly forces hold a mobility advantage over enemy forces or when friendly forces are insufficient to conduct an effective area defense. The mobile defense allows the enemy to maneuver to a position where he is exposed to a decisive attack by a striking force. The commander will split his force into two elements. The first is the fixing force. Its mission will be to stop the enemy's movement or channel him into a vulnerable area. The second element is the striking force. Its mission will be to conduct the decisive attack that defeats or destroys the enemy force. The striking force is always the main effort. The aviation brigade can be effectively employed in either role. As the fixing force, the brigade can use attack helicopters to blunt the enemy's attack and slow his movement while it employs air-delivered mines to further slow and canalize the enemy force. As the striking force, the brigade can employ it's attack helicopters to rapidly maneuver to the enemy's flanks. Its utility and medium lift units can rapidly move artillery and infantry into striking position to support the attack.

3-40. AREA DEFENSE

Area defense is terrain oriented. It is primarily used when the opposing force has a mobility advantage over the friendly force or when the commander's intent is to hold or deny the enemy use of critical terrain for a specified period of time. The aviation brigade could execute this mission when task organized with ground maneuver forces. It is characterized by multiple battle positions in depth oriented for interlocking fires on primary enemy avenues of approach. Aviation forces can rapidly maneuver to any location to mass direct fires for a counterattack or to defend a heavily engaged ground maneuver force.

SECTION XIII. Special Purpose Operations

Aviation brigades provide responsive assets for special purpose operations during close, deep, and rear operations. These brigades perform reconnaissance-in-force, raids, deception operations, and search and attack.

3-41. RECONNAISSANCE-IN-FORCE

The reconnaissance-in-force always is conducted by a large enough force to place the enemy at some risk while providing self-protection. It can be conducted by an aviation pure force or in conjunction with ground forces. It is a limited-objective operation that obtains information and locates and tests enemy dispositions, strengths, and reactions. It is used when the enemy is known to be operating in some strength in a given area, but sufficient intelligence cannot be developed by other means.

a. During the reconnaissance-in-force mission, the commander must be able to exploit any tactical success. The aviation brigade can exploit that success or extricate other forces. However, aviation forces normally are task-organized with other maneuver forces to execute a reconnaissance-in-force mission. The mission normally is planned and conducted as a deliberate attack.

b. In this operation, the reserve is an ideal mission for portions of the aviation brigade. Despite the terrain, helicopters can move to assist forces in contact much more rapidly than ground forces. The speed and flexibility of the aviation brigade are key in employment as a reserve force during reconnaissance-in-force operations.

c. If the call comes to reinforce and continue the attack, AHC assets place troops on flanks to keep the penetration gap open and reinforce leading elements. Air assault forces quickly position to support lead ground units in contact and greatly increase the momentum. Attack helicopters also stop, delay, or impede enemy reinforcements after air and ground cavalry forces have located them.

d. In extricating the attacking force, AHC assets extract dismounted troops, soldiers from disabled vehicles, and personnel slowed down by captured prisoners or enemy equipment and weapons. Assault helicopters may move troops from one delay position back to the next. Attack helicopters are useful in providing overwatching fires while armor and infantry units disengage and reposition in a delay. They also delay enemy reinforcements from arriving before friendly forces have pulled back across the forward line of own troops (FLOT).

3-42. RAIDS

A raid is a limited-objective attack into enemy territory for a specific purpose other than gaining and holding ground. Raids typically destroy key enemy installations and facilities, capture or free prisoners, or disrupt enemy C^2 or support facilities. Aviation brigades may be employed pure to conduct a raid with attack assets. Assault helicopter units can be task-organized under a maneuver headquarters to conduct air assault operations as part of a raid.

a. The raiding force must accomplish its mission and withdraw before the enemy can react. The most common raid missions are-

(1) Rescuing friendly personnel.

(2) Deceiving or harassing enemy forces.

(3) Capturing enemy materiel or prisoners.

(4) Obtaining specific information about the enemy.

(5) Destroying enemy materiel, installations, or personnel.

b. Aviation brigade assets will not usually move with a ground force preparing for a raid because of mobility differences. However, at times, they may meet the ground force at the objective to add firepower and provide security. Attack helicopters destroy, confuse, and divert the enemy and prevent it from being reinforced while the ground force completes its mission.

c. If a major enemy reaction occurs during the raid, attack and assault helicopters assist in the withdrawal or emergency extraction of the ground force. As with the reconnaissance-in-force mission, adding suppressive fires may hold off the enemy reaction force long enough for the ground force to withdraw. Assault helicopters may be the only available means of extracting the ground force in an emergency because of time constraints and terrain limitations. Attack helicopters can provide security while possibly assisting in the destruction of abandoned friendly vehicles.

d. Conducting the raid solely with helicopters is a natural outgrowth of the technological development in helicopters and changes in doctrine. The raiding force normally is composed of attack helicopter units and AHB assets. However, a pure attack helicopter force may perform a mission to destroy a CP or a multiple rocket launcher (MRL) unit. The increasing tactical emphasis on deep operations will cause a greater demand for ATKHBs to conduct raids.

e. During a raid, assault helicopters can insert and extract the raiding force. However, the length of time the force is on the ground makes waiting helicopters vulnerable to attack. Therefore, the force should be inserted by other means-such as airdrop or amphibious landing-and then be extracted by helicopters.

3-43. DECEPTION OPERATIONS

The four recognized types of deception operations are ***feints, demonstrations***, ***ruses****,* and ***displays***. The two types of deception operations most commonly performed by the aviation brigade are ***feints*** and ***demonstrations*** discussed below.

a. ***Feints.*** A feint is a supporting attack. It diverts the enemy's attention from the main effort. Cavalry, air reconnaissance, or attack helicopter units normally conduct feints on a limited basis. A feint usually occurs before or during a main attack to deceive the enemy. This deception causes the enemy to move its reserves and shift its fire support to meet the feint; thus, the main attacking force would meet less resistance. During defensive operations, feints often are used independently to keep the enemy moving and to disrupt its preparations for an attack. A series of feints also harasses and confuses the enemy. In some cases, feints cause the enemy to become careless. Units must execute the attack violently to convince the enemy that the feint is the main effort. If the feint penetrates the enemy's defenses, the commander may exploit his unexpected success with follow-on forces or change the course of the main attack to follow the feint. Planning for such contingencies must be made well in advance. The feint does not need to penetrate the FLOT to be effective. A violently executed attack may still cause the enemy to move its reserves and other main forces to the threatened sector.

(1) The feint must appear to be a serious attack. Therefore, helicopters normally associated with an attack must be present. Attack helicopters attack flanks to prevent enemy troops from moving to reinforce the threatened sector. After a breakthrough, they increase the momentum of the attacking force by destroying enemy forces and containing bypassed pockets of resistance. Attack helicopters also participate in the

initial attack.

(2) If an unexpected breakthrough is to be reinforced by deploying the reserves or altering the main attack route, helicopters are particularly useful. In either case, the momentum of the attack must be maintained until reinforcements arrive. Meanwhile, assault helicopters move dismounted troops and supplies to the lead unit in contact. Attack helicopters impede, destroy, or delay enemy reinforcements. They also aid the lead ground units in contact by increasing the rate of advance. Cavalry or air reconnaissance forces continue to screen flanks. These forces also report movements of enemy forces and critical information from all sectors.

b. *Demonstrations.* A demonstration is a show of force in an area in which a decision is not sought. A demonstration threatens attack but does not actually make contact with the enemy intentionally. Any element of the aviation brigade can conduct a demonstration. Assault helicopter assets accompanied by cavalry, air reconnaissance, or attack aircraft create an ideal demonstration that may appear to be an air assault operation.

(1) Demonstrations serve the same purpose as feints even though no contact is made with the enemy. Demonstrations lack the realism of the feint; however, the absence of physical contact with the enemy makes it easier to employ the demonstration force elsewhere. Like all deception operations, demonstrations require-

(a) A thorough knowledge of the enemy and its collection sources.

(b) Integration with friendly plans.

(2) Under normal battlefield conditions, the noise associated with helicopters is a liability. In demonstrations, however, it is the noise that makes helicopters so useful. Helicopters are an effective tool in limited visibility; the noise of moving helicopters-plus a soldier's natural tendency to exaggerate the enemy's numbers-makes this tactic successful. Demonstrations vary greatly in execution.

(3) To convince the enemy that friendly forces are moving from one staging area to another, the aviation brigade may use several empty helicopters to make repeated landings and takeoffs from a likely location. This activity can be combined with vehicular noise; it may be done at night or during adverse weather conditions. As enemy listening posts detect this noise and as enemy radar catches momentary blips moving in the same direction, the enemy may well conclude that a large redeployment is taking place.

(4) In an amphibious assault on an island or a peninsula, helicopters may make repeated landings at one location. These landings may cause the enemy commander to draw some of his forces away from the true assault objective.

(5) Helicopters may also be used to slingload an artillery section into a flank or a deep location for a demonstration. On a nonlinear battlefield, several scenarios may be feasible without directly engaging the enemy. A few artillery pieces that are firing from a decisive sector are located accurately by the enemy by means of radar, crater analysis, or sound sensing. The enemy may mistake this firing for a much greater activity taking place. Also, removing an artillery section before an enemy attack may cause the enemy to move its combat forces in another direction.

3-44. SEARCH AND ATTACK

Attack aviation assets or air cavalry units search for, and attack, specific targets within generally defined search areas. These missions are conducted when the target location is not known but a general vicinity of the target is estimated. Examples of search and attack missions are-

a. Attack helicopters hunting an isolated theater missile launcher-with supporting vehicles-and destroying them.

b. Air cavalry and light infantry engaging bypassed enemy forces.

c. Aviation and infantry reacting to a Level III threat that has already landed in our rear area.

SECTION XIV. Division Reserve Mission

3-45. DIVISION RESERVE MISSION

a. The aviation brigade provides the division commander with another headquarters in which he may build a reserve. Therefore, he may sometimes elect to fight with three brigades forward and configure the reserve around the aviation brigade. The aviation brigade executes the division reserve mission in addition to other mission requirements during close operations. A reserve is a portion of a force that is withheld from action at the beginning of an engagement. Thus, it is available for commitment later at a decisive point and time. When a commander sets a portion of his forces aside as a reserve, he has formulated a plan for these forces. Reserves are not used to redeem failures; reserves are designated by the commander to be committed at a decisive point and time to exploit success or to ensure mission accomplishment. Reserves are employed during offensive and defensive operations. In the offense, reserves exploit success by attacking enemy forces where they are weakest. Reserves reinforce or maintain momentum by passing through or around friendly units held up by enemy forces. Also, reserves can defeat enemy counterattacks. In the defense, reserves reinforce the defense of committed forces. They contain enemy forces that have penetrated friendly defenses. In addition, they counter rear area threats and relieve depleted units. During defensive operations, a reserve force is mainly to regain the initiative through offensive action.

b. The mission of the reserve requires flexibility and agility. Extensive planning, coordination, and liaison are required throughout the higher headquarters' AO. The reserve must be prepared to react anywhere within the higher commander's AO. Employment of the reserve may be to the flanks, rear, or it may execute branches and sequels to the basic plan. The reserve must also be prepared to reinforce the main effort or immediately transition to other operations. The brigade staff must monitor the entire battle area and maintain communications with all elements of the division or corps to anticipate mission requirements. Forces must be postured for continuous operations. As a rule, the size of the reserve force is two echelons below the size of the total force (i.e., for a division, a battalion; for a brigade, a company.)

ENEMY
BREAKTHROUGH

1 ✕ 2

1
✕

2
✕

✕
RESERVE
3

PRIORITY OF PLANNING
OPCON 1ST BDE
EXECUTE ➔ DIV COUNTERATTACK
REAR OPS
OPCON 2ND BDE
DEEP ATTACK

PRIORITY OF PLANNING
EXECUTE ➔ OPCON 1ST BDE
DIV COUNTERATTACK
REAR OPS
OPCON 2ND BDE
DEEP ATTACK

✕✕

✕✕
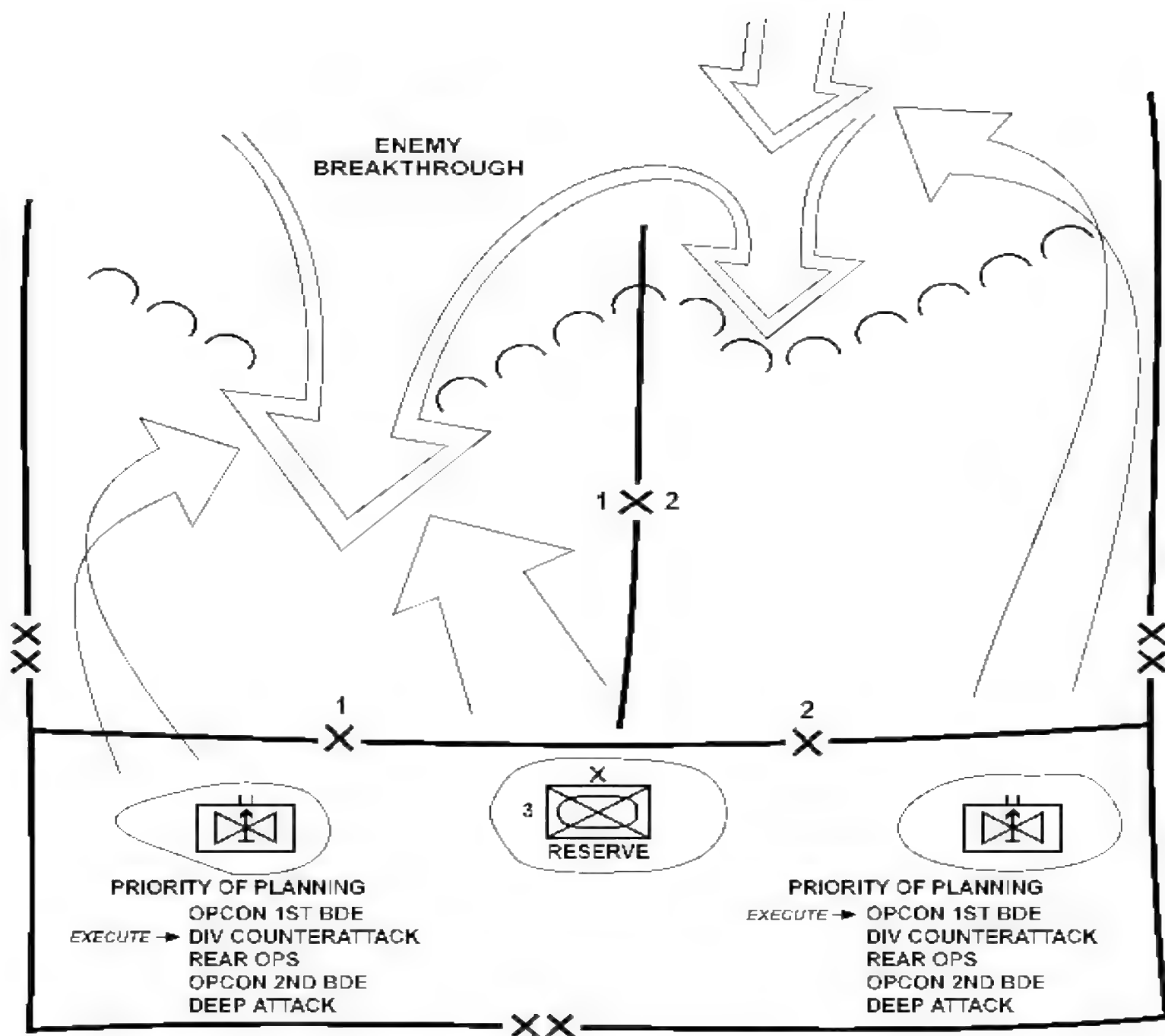
NOTE: Upon completion, the ATKHB can execute any of its other missions or begin planning new missions while awaiting commitment.

Figure 3-16. ATKHB employment options

3-46. NATURE OF RESERVE FORCES

Reserves must be able to move rapidly to seize opportunities on the battlefield. The size of the reserve force depends on METT-T. The size may be at least one-third of the entire force. At the division, the reserve may be composed of a maneuver brigade and the division's aviation assets. At the brigade, the reserve may be made up of a battalion TF with aviation assets placed under OPCON of the brigade. A battalion TF normally has a company team for a reserve. Aviation assets

under OPCON of the brigade may be tasked to augment or support a battalion's TF; however, these assets will remain under OPCON of the brigade headquarters.

3-47. AVIATION AS A RESERVE

Aviation forces are ideal for the division reserve mission. As the headquarters for a reserve, the aviation brigade plans missions to contain penetrations during close operations and to destroy enemy forces with counterattacks. When established as the reserve, the brigade normally is augmented with ground maneuver forces to enhance its capabilities for blocking actions and retaining critical terrain. In his planning, the brigade commander organizes combined arms TFs based on the commander's intent and METT-T. He issues "on-order" missions to organic units and units under OPCON that participate in reserve missions. He also plans CS and CSS requirements. As the reserve, the brigade also provides the division commander with a responsive force for conducting deep and rear operations contingencies. The brigade is employed as a reserve in the rear to counter threat incursions. Although the brigade headquarters is in a reserve posture, its subordinate units may remain actively engaged in maneuver, CS, and CSS operations throughout the division sector.

3-48. ATTACK HELICOPTER BATTALIONS

ATKHBs normally are a reserve for the division or a ground brigade. Attack forces may be held in depth initially and respond promptly when needed. They are often the most effective means of reinforcing defenses against armored attacks that have broken through. Because of weather (visibility) limitations and a potentially high AD threat, they should never be the only forces held in reserve. During offensive operations, attack helicopter forces are most often employed as a reserve during exploitation and pursuit.

a.In an exploitation, the ATKHB is employed as part of a larger force. As ground forces succeed offensively, the ATKHB disrupts and destroys enemy armor, artillery, C^2 assets, and CSS and other enemy forces attempting to reorganize.

b.In a pursuit, the ATKHB again forms part of a larger force. Ground forces continuously pressure the rear area of the withdrawing enemy. At the same time, attack helicopter forces attack along the flanks or move into blocking positions with AATFs blocking the enemy's line of retreat.

c. In the defense, attack helicopter forces mass to destroy enemy penetrations of friendly defenses. While ground forces engage the enemy from defensive positions, attack helicopter units maneuver to the flank and rear units of the enemy to attack in depth.

3-49. ASSAULT HELICOPTER BATTALIONS

With ground forces, assault helicopter units seize key terrain along an axis of advance for a friendly attack during offensive operations. They may seize and secure bridges, tunnels, and choke points that-if held by the enemy-could slow the attack. During the offense, assault helicopter forces may move friendly ground forces to the flanks of enemy forces as they withdraw and friendly forces continue their destruction during an exploitation. In a pursuit, AATFs seize a blocking position to close the enemy's lines of communication and to prevent enemy counterattacking units from entering the engagement. During the defense, assault helicopter forces seize key terrain and occupy blocking positions along the areas of enemy penetrations. In occupying a blocking position, the AATF gives the commander time and space so that he can reposition his resources to destroy

the penetration. The TF also allows the commander to retain the bulk of his reserves for a counterattack elsewhere so that he can regain the initiative. Assault helicopter forces move ground forces to the enemy's point of attack or maneuver quickly to the flanks of the enemy and counterattack.

Chapter 4

Joint and Combined Arms Operations

This chapter addresses the joint and combined arms support that may be allocated to the aviation brigade. Aviation brigade commanders may be designated to command brigade-size task forces. These task forces consist of aviation maneuver and combat support (CS) elements, combined arms and joint forces, combat service support (CSS) assets, and even multinational ground and aviation forces. Aviation brigade commanders must understand joint and combined arms capabilities to effectively execute their missions. Division and corps assets normally provide CS assets to the aviation brigade. When aviation units are under the operational control (OPCON) of ground maneuver forces, the controlling brigade task force will provide and coordinate the required combat support. If the aviation brigade operates as a task-organized controlling headquarters for specified missions-for example, a covering force operation-additional CS assets will be provided.

4-1. FIRE SUPPORT

a. **Personnel.** When provided, the fire support coordinator (FSCOORD) in the brigade fire support element (FSE) plans and coordinates fire support for the aviation brigade the same as for ground brigades. The division aviation brigade force structure does not include organic fire support personnel. The division artillery (DIVARTY) provides the fire support section (FSS) for the aviation brigade. The cavalry squadron has no organic FSS nor a fire support team (FIST). The DIVARTY headquarters provides the FSS to the attack helicopter battalions (ATKHBs) and cavalry squadrons. In addition, DIVARTY provides a FIST for each of the two cavalry troops. The headquarters element of the corps aviation brigade has no organic fire support personnel. However, fire support planning and coordination assistance is available at the appropriate artillery headquarters. At the corps artillery level, the corps artillery headquarters provides one FSS per ATKHB.

b. **Assets.** Various fire support assets are available to the aviation brigade or subunits of the brigade. These assets include field artillery (FA), naval gunfire, close air support (CAS), and mortars. FM 6-20 further describes fire support in combined arms operations to include priorities of fire, targets, and target effects.

(1) **Field artillery.** Artillery traditionally has three functions: close support, interdiction, and counterfire. Suppression of enemy air defenses (SEAD) may be supported by any one of these functions. A habitually associated direct support (DS) artillery unit to support aviation assets does not exist under current table of organization and equipment (TOE) force structures. Under certain contingencies, aviation assets could be task-organized with FA in the DS role. A DS artillery unit could be allocated from corps artillery assets or from division artillery units.

(2) **Naval gunfire and close air support.** Naval gunfire and CAS can provide the same fire support as FA. When naval support is available, the FSE of the aviation headquarters is provided a naval gunfire liaison team to control the support. An Air/Naval gunfire liaison officer or team may not be available. If so, the fire support officer (FSO), fire support team, scouts, or aerial fire support observer (AFSO) must control the naval gunfire. A forward air controller (FAC) or tactical air control party (TACP) from the the Air Force or Marine TACP normally would provide terminal control of CAS.

(3) **Mortars.** Limited mortar fire support for SEAD during aviation operations may be coordinated and obtained from the supported ground maneuver unit. Mortar sections within the heavy division cavalry squadron may also provide mortar support.

(4) **Other fire support assets.** While it is not their primary role, certain air defense (AD) weapons (i.e., Vulcan) and tanks could provide fire support. The force commander weighs the

consequences of losing a system in its primary role before committing it to a fire support mission.

4-2. JSEAD OPERATIONS

a. Joint Suppression of Enemy Air Defense (JSEAD) is a support activity that can significantly increase the effectiveness and tactical flexibility of aviation forces (all services). JSEAD is that activity that neutralizes, destroys, disrupts, or temporarily degrades enemy ADs in a specific area by physical attack and/or electronic warfare (EW).

b. In developing a JSEAD plan, planners consider the spectrum of combat multipliers available to the commander. A JSEAD plan is developed-based on guidance from the next higher echelon-within the brigade, division, and corps staffs; however, the execution may involve one or more services. The three types of JSEAD recognized across all services include theater, localized, and opportune. Theater JSEAD operations are preplanned, theater-wide efforts. The joint force air component commander (JFACC) is responsible for planning these operations; the joint staff normally executes them. These operations are conducted, concurrently over an extended period, against AD systems normally located well behind enemy lines. Localized JSEAD operations support tactical air operations, Army aviation operations, reconnaissance, and the establishment of corridors for Air Force and Army assets. Planning for these operations begins at the echelon requesting the support. Opportune JSEAD is usually unplanned and involves aircrew self-defense and attacks on targets of opportunity. It is important to note that Army aviation assets may be tasked to provide JSEAD support to other services as well as receive JSEAD support.

(1) *Responsibilities.* The Joint Force commander (JFC) establishes objectives and monitors JSEAD planning and execution. Based on the JFC's guidance, the ground and naval fire support coordination centers and FSEs determine the air and surface suppression systems available to conduct JSEAD. JFC guidance specifies the roles of air, land, maritime, space, and special operations forces in the conduct of the joint campaign. The JFC guidance establishes the requirements for J-SEAD to facilitate these operations.

(2) *Planning.* The corps is the primary planning headquarters for Army JSEAD operations. The air support operations center (ASOC), located at the corps headquarters, is the Air Force element through which coordination for immediate JSEAD will be accomplished. For pre-planned JSEAD, requests are forwarded from the corps to the battlefield coordination detachment (BCD) located within the air operations center (AOC). At division and lower, the FSE ensures that the localized JSEAD program is coordinated under the direction of the G3. Localized JSEAD operations are planned for specific missions. The targets are preplanned; however, they are less precisely located. Otherwise, they would have been candidates for immediate engagements. During local JSEAD operations, assets attack enemy AD targets near the ground target of the air operation and the corridor to and from the target area. This type of JSEAD usually is temporary but begins before aircraft arrive at the forward line of own troops (FLOT). Joint Publication (JP) 3-01.4 provides more detailed guidance for JSEAD operations.

(3) *Coordination.* The FSE is the focus of JSEAD coordination at each echelon of command. Based on the commander's battle plan and mission, enemy, terrain, troops, and time available (METT-T), the fire FSCOORD determines which enemy AD systems could hinder the mission, how these can be attacked, and what type of suppression effect is desired. Attack means are aligned with specific types of enemy systems. Acquisition assets are then concentrated-based on intelligence preparation of the battlefield (IPB) and target value analysis-on detecting and locating enemy AD systems.

(4) *Techniques.* As a rule, artillery is used against targets that are within range and accurately located. Intelligence and electronic warfare (IEW) support and air support assets suppress

targets that are not as precisely located, beyond artillery range, or that are better suppressed by electronic means. Suppression must begin before aircraft arrive at the forward FLOT and must continue throughout the crossing of the FLOT. FA is a primary means of suppression. However, mortars, electronic jammers, and maneuver units also may execute the JSEAD plan.

(5) *Execution.* The commander ensures that his staff conducts the necessary coordination to obtain assets available in the time allotted to execute the mission. Coordination is required at many levels to establish JSEAD programs. Aviation commanders need to ensure that their maneuver counterparts are aware that aviation assets should not be employed back and forth across the battlefield on a moment's notice. JSEAD planning for cross-FLOT assault or attack helicopter operations includes certain considerations. They are as follows:

(a) Target acquisition assets are tasked to locate and track suspected or known enemy AD systems. Primary assets include unmanned aerial vehicles (UAVs), the Joint Surveillance Target Attack Radar System (JSTARS), electronic intelligence, communications intelligence (COMINT) sensors, and human intelligence (HUMINT) assets. Assets must be allocated to suppress each particular threat system.

(b) Communications jammers across the services are used to disrupt enemy command and control (C^2) systems at the FLOT and during the entire operation.

(c) Artillery is dedicated to destroying or suppressing those targets within range.

(d) Fixed-wing assets are tasked to suppress those enemy AD systems that are beyond Army artillery's capability and range or that are better suppressed by fixed-wing assets. These fixed-wing assets may include Compass Call, EA-6B aircraft, and EF-111 Raven aircraft.

(e) Army aviation assets can infiltrate low level to attack cross-FLOT targets. These targets include AD systems or critical C^2 nodes. Army aviation needs to ensure that its weapons mix enables it to suppress targets of opportunity not identified earlier.

(f) Ground and air maneuver must be coordinated for the JSEAD plan. A ground attack may need to be synchronized with an air operation to open an air corridor.

(g) Given enough time for insertion, Special Operations Forces (SOF) could disrupt selected critical AD nodes.

(h) JSEAD operations may be required for units returning from cross-FLOT operations along different routes.

4-3. AIR OPERATIONS

a. *USAF air operations.* The USAF performs air operations that can-

(1) Gain and maintain air superiority.

(2) Prevent movement of enemy forces into and within the objective area.

(3) Seek out and neutralize or destroy enemy forces and their supporting installations.

(4) Join with ground forces in operations within the objective area to assist in attaining their immediate objective.

b. *Aviation Brigade Missions.* USAF missions that compliment and support ground maneuver are counterair, air interdiction, CAS, airlift, surveillance and reconnaissance, and special operations. US Army forces, specifically aviation brigades, normally are employed with, or may receive support from,

air assets performing these missions:

(1) *Counterair.* Counterair missions are conducted to attain and maintain air superiority. However, within the counterair effort, air assets perform JSEAD by attacking enemy AD systems through EW or by destroying them. SEAD missions normally are preplanned. SEAD targets include enemy AD radar systems, surface-to-air missiles (SAMs), or antiaircraft artillery. EC-130 Compass Call and EF-111 Raven aircraft are part of the SEAD campaign. They can jam enemy radar and communications.

(2) *Air interdiction.* Air interdiction operations are conducted to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces; the operations are conducted at such distances from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required.

(3) *Close air support.* CAS supports land forces by attacking an enemy close to friendly forces. Detailed integration always is required by the land and air forces employing CAS; thus, these missions can support the fire and maneuver of the Army. CAS influences the ground battle by delivering a range of weapons and massed firepower at decisive points. CAS also may be effective in rear operations. CAS missions are flown at the request of ground forces. However, the missions are controlled by the USAF through the tactical air control system (TACS). CAS must be responsive to maneuver forces. It may include preplanned and immediate sorties. A preplanned CAS mission may be scheduled 24 hours before a counterattack that requires the participation of the entire combined arms team. However, an immediate CAS mission may be required when enemy forces attack unexpectedly and the force ratio shifts dramatically. Immediate CAS may arrive as soon as an airborne flight can be diverted to the sector.

(a) CAS normally is flown near the FLOT. Because of exposure to enemy fire, CAS aircraft maneuver mostly over friendly territory and employ tactics that minimize their exposure. JSEAD greatly improves the success of a CAS mission. Without JSEAD support, fighter attrition may be unacceptable and preclude additional sorties to, and in, a particular sector.

(b) CAS targets normally are maneuver forces within close range of friendly forces. Lucrative CAS targets include moving armor, light-skinned vehicles, and personnel. However, static, camouflaged, and dug-in forces are difficult to visually acquire from an aircraft. The A-10 Thunderbolt and F-16 Fighting Falcon often are used as CAS aircraft. Their tight turning ability is essential to attacks and evasive maneuvers around the FLOT. Other Army, USAF, Navy, and Marine combat aircraft, both fixed- and rotary-wing, also can perform CAS.

(c) A special form of CAS is created when USAF CAS aircraft and Army aviation forces operate together to locate and attack enemy forces. This is a joint air attack team (JAAT). JAAT missions can be preplanned or immediate. A JAAT is most effective against high-priority, lucrative targets such as an armor force on the move. Artillery and SEAD support may be essential to a successful JAAT attack.

(4) *Surveillance and reconnaissance.* This mission is commonly referred to as "recce" in the Air Force. The mission provides the air and ground commanders with photographic and electronic information about the location, disposition, and actions of enemy forces. It also can assess the effectiveness of air and ground attacks by providing battle damage assessment (BDA) to determine target status and future operational requirements. The RF-4 performs tactical surveillance and reconnaissance.

(5) *Theater airlift.* Theater airlift provides mobility for ground forces; it can deliver combat

troops and supplies. Specific missions include movement of combat, CS, and CSS assets between adjacent commands or areas of operation. Theater airlift also augments aeromedical evacuation, supports special operations, and delivers airborne combat troops. Theater airlift operations are conducted primarily with C-130 aircraft.

c. *Command and Control.*

(1) *Joint force air component commander.* The JFACC is responsible for the entire theater air battle. He must be able to mass his forces and conduct a variety of air operations. The ability to shift or mass forces calls for centralized control. In contrast, detailed mission planning and execution demand decentralized execution. The JFACC implements the principle of centralized control and decentralized execution using the management tool of the TACS. He directs air forces according to the JFC's broad plan of action and the threat.

(2) *Apportionment and allocation.*

(a) The JFC is responsible for air apportionment-the determination and assignment of the total expected air effort by *percentage or priority* that should be devoted to the various air operations or geographic areas for a given time. Apportionment is based on priorities established by the JFC during consultation with the subordinate commanders; thus, limited assets are optimally distributed to perform a variety of missions. Apportionment depends on the threat and mission objective. These missions can include but are not limited to:

- Interdiction.
- Strategic attack.
- Counterair.
- Close air support.
- Reconnaissance.
- Maritime support.

(b) After consulting with other component commanders, the JFACC/JFC staff makes the air apportionment recommendation to the JFC. Once the JFC makes the apportionment decision, the air component commder (ACC) allocates the assets. Allocation is simply the conversion of the apportionment percentages into the number of sorties for each operation. This step includes specifying the sorties to strike approved targets and the sorties available for CAS.

(3) *Theater air control system.* The TACS and its senior control element, the air operations center (AOC), serve as the C^2 system. Through this system, the ACC establishes and exercises control over his assigned forces.

(4) *Air operations center.*

(a) As the operational focal point of the TACS, the AOC allocates the JFC's apportionment of assets. The AOC determines the number of sorties by the type of aircraft available for each operation. Personnel at the AOC select-

- Units.
- Ordnance.
- Weapon systems.
- Times on target.
- Force package composition.

- Associated details of air control arrangements.

(b) The AOC disseminates the airspace control plan (ACP), airspace control orders (ACOs), and air tasking orders (ATOs) to-
  - The flying units.
  - The air support operations centers (ASOCs) located at each corps headquarters.
  - Other agencies of the TACS.

(c) A battlefield coordination detachment (BCD) coordinates planning (including target selection for air interception (AI) missions with the AOC).

(5) *Battlefield coordination detachment.* The BCD is an Army liaison provided by the ACC to the AOC and/or to the component designated by the JFC to plan, coordinate, and deconflict air operations. The BCD processes Army requests for air support, monitors and interprets the land battle situation for the AOC, and provides the necessary interface for exchange of current intelligence and operational data. It is a critical organization in theater for integrating deep operations beyond the fire support coordination line (FSCL) as well as advising the ACC of airspace control measures short of the FSCL. The BCD may or may not be TDA authorized.

(6) *Air support agencies.* Two TACS agencies, other than the AOC, provide responsive air support. These agencies are the ASOC and the TACP.

(a) *Air support operations center.* The ASOC plans, coordinates, and directs air operations in support of ground forces. It is collocated with the senior Army TOC, normally at corps. It provides fast reaction to immediate requests for air support.

(b) *Tactical air control party.* The TACP consists of USAF personnel experienced in airlift, reconnaissance, and fighter operations. TACPs are assigned at each Army echelon down to the battalion; the senior officer is designated the ALO. The ALO advises and assists the ground commander and requests and coordinates air support. The tactical air coordinator (airborne) assigned at each battalion or squadron controls CAS aircraft. Aviation brigades are normally not organized with organic TACPs; however, they often receive their assets for a specific mission or time. Aviation brigades often operate with air support assets and require TACP coordination and synchronization.

(7) *Air support requests.*

(a) Requests for air support are divided into two categories: *preplanned* and *immediate.* A *preplanned* request is a request for air support when time is available for detailed mission coordination and planning. These requests are forwarded through Army S-3 channels for final Army approval. These requests must be submitted 36 to 48 hours before time on target. An *immediate* request is a request for air support when there is no time for planning. Immediate requests for air support are forwarded through USAF channels on the high-frequency air request net from the TACP directly to the ASOC.

(b) In general, any Army level of command can request immediate air support. Any intervening Army headquarters in the request channel can approve the request (silence on the net for a specified time is considered approval), substitute another type of support (for example, FA), or disapprove the request. In all cases, the requesting agency must be notified if the request is denied. Only ground force commanders or designated representatives can cancel or disapprove air support requests. USAF elements can only advise, manage, and control.

4-4. ENGINEER SUPPORT

a. *Brigade Engineer.* When engineers support aviation assets, the commander of the engineer unit serves as the brigade engineer. He advises the commander on the use of the engineers and their equipment. The engineer estimates unit capabilities, materiel support requirements, and the time required to accomplish the mission. The brigade engineer is the commander's single point of contact for engineer support.

b. *Functions.* Engineer units can support the aviation brigade in various ways. These include mobility, countermobility, survivability, topographic, and infantry support.

(1) *Mobility.* Mobility support is primarily forward aviation combat engineering tasks such as clearing landing zones (LZs) and constructing assault air strips. Engineers may support aviation with countermine, counterobstacle, and gap-crossing tasks. However, aviation more likely will support these tasks during combined arms operations by providing smoke, suppressive direct fires, aerial observation for indirect fires, and troop transport to secure the far side while engineers conduct breaching operations.

(2) *Countermobility.* Countermobility support is conducting mine warfare and reinforcing obstacle tasks to enhance the effectiveness of engagement areas (EAs). Engineers emplace conventional mines as part of the tactical barrier plan or as a protective measure for static installations such as depots, maintenance and supply facilities, and airfields. Engineers also have ground-emplaced mine scattering systems. With the introduction of Air Volcano, aviation's UH-60 Black Hawks have a scatterable mine capability. Engineers can assist with training in emplacement and reporting requirements for Air Volcano. Reinforcing obstacles can include demolition of bridges and creation of road craters, construction of tank ditches and log cribs, and atomic demolition. Part of this mission is to delay the enemy and divert it into selected areas so that maximum combat power can be massed on enemy concentrations. These operations canalize the enemy into killing zones and degrade the enemy's ground mobility, increasing the enemy's time in the engagement area (EA).

(3) *Survivability.* Survivability is the development of protected positions. Survivability support can be used by aviation to protect command posts (CPs); helicopter parking areas; forward arming and refueling points (FARPs), and maintenance facilities from enemy observation and direct and indirect fires. Engineers may support aviation with deception operations by constructing decoys and dummy aviation facilities. FM 90-12 discusses base defense engineering operations.

(4) *Topographic.* Topographic support includes map production, map distribution, and terrain analysis tasks. Topographic engineers provide maps of the corps area. The corps has a terrain analysis platoon, which can provide various map overlays such as aerial obstacles and landing zones.

(5) *Infantry.* Infantry support is an action of last resort. For rear operations, the engineers may have an on-order mission to engage the enemy. The engineers will reorganize as light infantry in platoon- or company-size units for possible air assault operations. These engineers will require additional support such as antitank weapons, indirect fire support, medics, and aircraft support. However, using engineers as infantry stops all engineer work and eliminates their combat multiplier effect. FM 5-100 contains more detail on engineer operations.

4-5. AIR DEFENSE

a. *Mission.* The mission of US Army air defense artillery (ADA) is to protect the force and selected geopolitical assets from aerial attack, missile attack, and surveillance. This threat includes all aircraft, indirect fire surface-launched missiles, aerial surveillance platforms, and theater missiles. The worldwide proliferation of advanced technologies makes UAVs, intercontinental ballistic missiles,

cruise missiles, and even satellites a portion of this ever-growing threat. ADA commanders allocate assets based on the supported commander's priorities. Commanders within aviation are faced with additional burdens. They may be conducting operations within airspace that is heavily congested with both threat and friendly aircraft. They also are in an environment of fire support and AD weapons of unprecedented quantity and lethality. Aviation commanders must have an in-depth knowledge of AD resources. FM 44-100 includes a more detailed discussion of these operations.

(1) *Theater air defense.* At theater level, the USAF and high- to medium-altitude air defense (HIMAD) usually provide AD protection to the theater commander's assets and the theater as a whole. Resources include allied and USAF counterair aircraft and US Army Hawk and Patriot SAM units. Hawk is an Army National Guard (ARNG) roundout asset that would be activated as a roundout component. The availability of these resources depends on how critical the maneuver commander's battle is to the overall objective. For example, if one division's objective is considered pivotal to the battle, the theater commander most likely commits CAS and counterair resources to support that division. In this instance, a Hawk battalion can be used in the general support-reinforcing or reinforcing role. Within the division area, the degree of AD support to individual brigades depends on the criticality of their role in the overall division objective. Aviation employed in deep, close, or rear operations should be allocated AD support.

(2) *Corps air defense.* At corps level, the same principle of allocating AD resources applies as at theater level. Also, reductions in force structure dictate the availability and type of AD resources at individual corps. One corps may have two Avenger battalions and one Patriot battalion. Another corps may have two gun and Stinger battalions, one Chaparral roundout battalion, one Avenger roundout battalion, and one Patriot battalion. The availability of these resources at the corps provides AD leverage to the corps commander. He, in turn, can influence the battle at division level by committing available corps AD assets at the decisive time and place.

(3) *Division air defense.* At division level, the organic forward area air defense (FAAD) battalion provides AD protection. The maneuver brigades' fighting in close operations must be protected against threat attack helicopters and ground support fighters. Also, high-priority assets in the rear operations area require protection by limited AD resources. Thus, the division, the AD battalion, and maneuver brigade commanders must establish priorities and continually reevaluate defended assets. Aviation assets provide a high degree of mobility, flexibility, and firepower to the division. However, these assets are extremely vulnerable to air attack. The aviation commander must ensure that AD protection for his forces is adequate; also, he must ensure that AD elements are integrated into the AD plans for every area where the brigade will operate. Forces may maneuver out of their supporting ADs and into another unit's maneuver area because of the brigade's mobility. The brigade must coordinate with, and integrate, into the AD system and airspace management scheme of that unit. Overall coordination within the division area with the division's AD battalion commander (division AD officer) will ensure AD continuity.

(4) *Unit air defense.*

(a) At unit level, the final level of protection for the aviation brigade is passive AD. Passive AD measures are employed routinely and organic weapons are engaged against enemy aircraft. Passive measures reduce the probability of attack and limit damage in case of attack. These measures include-

- Terrain masking procedures.
- Maximum standoff ranges.
- Minimum exposure times.

- Cover, concealment, and camouflage.

(b) If the brigade is not discovered, the probability of being hit diminishes to near zero. If air attack cannot be avoided, the brigade's organic weaponry must be directed against the enemy for self-defense. Commanders should stress the importance of self-defense for maneuver units. FM 44-64, Annex C, contains detailed guidance on unit self-defense against air attack. FM 1-101 also is a useful reference.

b. *Army Airspace Command and Control Link.* The corps aviation brigade commander on the modern battlefield must coordinate the entry of aviation assets into the airspace. To limit the risk of engagement by friendly forces, the commander must fully use the existing command, control, and communications (C^3) structure. He must also require his forces to adhere to directed control procedures. A strong link with the Army airspace command and control (A^2C^2) elements at the corps and division must be established and maintained. This link allows information that affects users of the theater airspace to be rapidly disseminated. The A^2C^2 element should provide all pertinent airspace information during planning, as well as coordinate with other users, to prevent conflict throughout the operation. FM 100-103 discusses A^2C^2 in more detail.

c. *Identification Friend or Foe (Radar) Systems.* IFF systems enable aviation commanders to reduce risk for aviation assets, but they are not the entire cure for fratricide. A combination of both positive and procedural control measures must be used. JP 3-56.1 states the JFACC, if appointed the airspace control authority (ACA), will develop, coordinate, and publish airspace control procedures and will operate the airspace control system in the joint operations area. This means that the procedures required in each theater will vary. This JP goes on to say that, in stability and support operations (SASO), all air missions, including both fixed- and rotary-wing of all components, must appear on the appropriate air tasking order (ATO) and/or flight plan. In some theaters and operations, a flight plan alone may meet this requirement while in others it would not. In addition, all aircraft must monitor a common frequency and operate on designated IFF modes and codes. In practice, forward area air defense (FAAD) units combine IFF and visual identification for engagement. Most high-to-medium air defense (HIMAD) units operating near the division rear area do not have this visual capability. Aircraft operating in that airspace will be interrogated and then evaluated against activated airspace control means. If the IFF system is inoperative or turned off, or the pilot is unaware of its proper use and codes, the aircraft may be at risk. Pre-approved procedural methods of identification must still be used by friendly AD assets to identify aircraft.

(1) *Air defense and IFF use by aviation units.* AD IFF systems, along with aviation IFF systems, are the primary means of identification. Commanders must ensure that IFF equipment in their aircraft is maintained and serviceable, and that aircrews are trained to use it. With or without the IFF system, aircraft still have to adhere to the procedures for identification outlined in the theater airspace control plan.

(2) *Tactical IFF use.* The airspace ACA directs the tactical use of IFF within a theater of operation. This authority applies to all airspace users, including Army aviation assets. For example, corps aviation assets, which have numerous missions, may fly within and throughout a division or corps area of operations. Supplementary doctrine is appropriate for brigade assets when they are involved in deep, close, and rear operations.

(a) *Deep operations.* When aviation assets are involved in deep operations beyond the fire support coordination line (FSCL), theater-specific procedures based primarily on the threat's capabilities will be performed. All theaters and operations will have published procedures for identification outlined in the theater if IFF OFF and ON lines are established.

(b) *Close operations.* In close operations, aviation assets must have Mode 4 turned on. Thus, friendly aircraft have maximum protection during most combat operations, especially at night or during adverse weather conditions.

(c) *Rear operations*. Aviation operations in the corps or division rear area also are conducted with IFF Mode 4 turned on.

4-6. INTELLIGENCE AND ELECTRONIC WARFARE SUPPORT OPERATIONS

Aviation commanders and staffs obtain support to plan and execute operations from IEW support operations. In the aviation units, the IEW structure consists of the commanders, staffs, IEW support personnel, and other organic and supporting units. The aviation S2 and S3 coordinate IEW operations. They must ensure that the system is responsive to the commander's intelligence requirements (IRs) and priority intelligence requirements (PIRs). Well-defined IRs/PIRs provide a focus for collection of intelligence to support the unit's mission. IEW systems at battalion and brigade level collect information in one of three distinct military intelligence (MI) disciplines: HUMINT, signals intelligence (SIGINT), and imagery intelligence (IMINT). The IEW systems within each of these MI disciplines meet mission demands by providing three forms of IEW support: intelligence, EW, and counterintelligence. IEW are subsets of information operations. FM 100-6 describes these concepts in much greater detail.

a. *Intelligence.* Battle success depends on the force commander's ability to see the battlefield. Threat forces must be surprised and caught at a disadvantage as often as possible. Their strengths must be avoided and their weaknesses exploited. Thus, commanders must have clearly defined areas of operation (AOs); they also must understand the conditions in which they will fight and the nature, capabilities, and activities of the threat. Intelligence operations obtain reliable information about the enemy, weather, and terrain and provide it as quickly and completely as possible to the commander. A key system in this process is the all source analysis system (ASAS) located within the analysis and control element (ACE) supporting various G2 staffs. This system allows subordinate units access to a higher echelon intelligence data base. This intelligence can be accessed by landline, satellite communications (SATCOM), frequency modulated (FM) radio; it can provide the aviation commander with real-time intelligence updates.

(1) *Intelligence preparation of the battlefield*. IPB-a systematic and continuous approach for analyzing the enemy, weather, and terrain-is the principle tool the aviation S2 uses to predict probable courses of action. Through IPB, the S2 reduces battlefield uncertainties. The commander can then select the best course or courses of action. Table 4-1 (below) shows a few IPB products and their applications to aviation units.

Table 4-1. Products and applications of the IPB process

PRODUCT (Combined Obstacles Overlay)	APPLICATION
Combined obstacles (wet/dry)	Friendly or enemy avenues of approach
Soil	Landing zone/drop zone (LZ/DZ) selection
Vegetation	NOE flight concealment
Line-of-sight (LOS) analysis	Electronic warefare (EW), communications, NOE routes, surveillance
Obstacles nap-of-the-earth (NOE) flight	NOE routes, flight
Lines of communication	Main supply route (MSR) selection
Terrain-influenced wind overlays	All aviation operations nuclear, biological, and chemical (NBC) operations
Cloud coverage	Air avenues, acquisition

Fog/Smoke	Air avenues, fields of fire, radar capability, LOS All aviation and ground operations
Infrared (IR) changeover	Forward-looking infrared radar (FLIR), navigation operations

(2) *Graphic products and decision support templates.* The S2 section of the aviation unit also will provide graphic displays of doctrinal, situation, and event templates. These templates are tools used by the S2 to facilitate informed decisionmaking during the command estimate process. The S2 uses these tools to wargame the probable enemy courses of action, and, along with the unit commander and the S3, develop the decision support template (DST) and the battlefield operating system (BOS) synchronization matrix. IPB also produces a written product, the intelligence estimate. For obvious reasons, the DST is the most important graphic product; it translates the results of IPB, intelligence estimates, wargaming, and the operational plan into graphic form. With it, the commander can exploit assailable enemy flanks and select high-value targets for engagement. He also can interdict critical points to force the enemy to abandon a course of action.

(3) *Collection management.* Collection management by the S2 is the means by which IR/PIR not answered through IPB are satisfied by intelligence collection. Reconnaissance and surveillance planning must be thorough whether the aviation unit is employed in a covering force or occupying terrain as a combat team. The plan must be updated as the situation changes. Because of the great distance that may be influenced by aviation, the S2 must coordinate continuously with the G2 and the ACE in the division tactical operations center (DTOC) or corps tactical operations center (CTOC). Reconnaissance and surveillance assets ordered to monitor high-value targets within named areas of interest (NAIs) give the commander a time-phased picture of the battlefield. They also give him options for using critical assets in a timely manner. FM 34-1 contains detailed information on collection management.

b. *Electronic Warfare.* EW is an essential element of combat power. Its contribution lies in exploiting enemy weaknesses, protecting friendly freedom of action, and reducing security and communication vulnerabilities. Modern military forces depend on electronics for C^2 of forces and employment of weapon systems. Friendly and enemy forces are vulnerable to actions that can reduce the effectiveness of their electronics. Properly applied EW can locate, identify, target, deceive, delay, disorganize, and destroy the enemy when integrated into the overall concept of the operation. FM 34-1, FM 34-7, and FM 34-10 provide detailed information on EW.

(1) *Electronic support.* ES involves actions to intercept, locate, and identify threat sources. ES provides combat information for the S2 to meet the commander's IR/PIR. The S2-following the commander's guidance-must establish priorities for ES orders and requests. He must continuously update ongoing ES operations, and anticipate future ES operations by tasking organic ES assets and coordinating with the IEW support element within the ACE.

(2) *Electronic attack.* EA involves actions taken to prevent or reduce the use of the electromagnetic spectrum by hostile forces. The aviation S3 has staff responsibility for overall planning and coordination of EW operations. He primarily directs the EA in jamming and deception roles. With the S2, FSO, and IEW support element, the S3 will establish priorities for targets. EA is directed against targets to degrade the enemy's ability to respond quickly and effectively.

(3) *Electronic protection.* EP involves actions taken to retain friendly use of the

electromagnetic spectrum. The S3 coordinates with the signal officer to establish EP to protect friendly signal operations. Training in the correct employment of the signal emitters and emitter capabilities and design is necessary for successful EP. Equally important is training in the correct use of signal operation instructions (SOI), communications discipline, and proper radio and telephone operating procedures.

c. *Counterintelligence.* CI is that activity intended to detect, evaluate, counteract, and prevent hostile intelligence collection, espionage, subversion, sabotage, terrorism, or assassination conducted by, or on behalf of, any foreign power, organization, or person operating to the detriment of the US Army. It includes identifying the collection and analysis capabilities of hostile intelligence, determining friendly vulnerabilities posed by hostile intelligence capabilities, recommending measures to preserve friendly operations security (OPSEC), and evaluating the effectiveness of friendly OPSEC measures. CI operations achieve the objective of enhancing the overall security posture by supporting OPSEC, deception, and rear area operations. Although CI is predominantly a HUMINT asset, multi-discipline CI (MDCI) operations fuse intelligence from HUMINT, SIGINT, and IMINT sources.

4-7. JOINT INTELLIGENCE GATHERING ASSETS

a. *Joint Surveillance Target Attack Radar System.* JSTARS is a joint system designed to support ground operations. It consists of an E-8A/C airborne radar system designed to track threat ground targets. This intelligence gathering platform operates in a racetrack pattern behind the FLOT; it can track targets forward of the FLOT. The system also has a limited capability to track helicopter frames. Threat targeting data (target locations) sensed by JSTARS is down-linked to a ground-based computer terminal and displayed on a monitor. This type information is retrievable through the ASAS, or can be directly transmitted from the JSTARS to the aviation brigade ground station module (GSM).

b. *Ground Station Module.* The GSM is the corps, division, and brigade commander's gateway to the JSTARS platform. This system provides near real-time information for targeting, surveillance, and situational awareness. The GSM is tied into the Army's command, control, communications, and intelligence (C^3I) network using secure data links. This system provides the maneuver commander a significant capability beyond the common targeting/tracking picture provided to all maneuver commanders. Sector searches can be requested directly from the maneuver brigade TOC to the JSTARS platform. A sector search is a more focused radar scan of a given area within the larger radar sweep. Sector searches can be executed by the JSTARS simultaneously in conjunction with the general area radar sweep.

c. *U-2R.* The U-2R is an Air Force high-altitude, reconnaissance aircraft whose mission is to conduct reconnaissance and provide aerial photographs and video downlink of specific areas/targets.

d. *Airborne Warning and Control System.* AWACS is an Air Force airborne C^2 platform. The AWACS extends low-level radar and radio coverage beyond those attainable by ground elements and low-level operating aircraft. This platform can provide AD warning, aircraft control, navigational assistance, coordination of air rescue efforts, and airspace control functions. The AWACS may be used in operations of short duration that do not warrant the use of ground elements, or when the tactical, political, or geographic situation denies access to secure land areas.

4-8. CORPS AND DIVISION AERIAL INTELLIGENCE AND ELECTRONIC ASSETS

a. *MI Battalion (Aerial Exploitation) (Corps).* The MI battalion (AE) provides the corps commander with his organic "deep look" system through aerial reconnaissance, surveillance, and SIGINT collection, analysis, and reporting. Looking deep into threat territory, the battalion finds and follows enemy forces through physical and electronic signatures. It uncovers critical targets inaccessible to corps ground-based systems. Through its aerial signal collection and surveillance operations, the MI battalion (AE) provides the commander with information critical for both close and deep operations.

Battalion assets include: Aerial reconnaissance low (ARL); Guardrail for communications intelligence; and QuickLook for noncommunications intelligence.

> **(1) *Guardrail.***
>
> > **(a) *Capabilities.*** Guardrail provides collection and emitter location information on threat communications. It intercepts enemy very high frequency (VHF), ultra high frequency (UHF), and limited high frequency (HF) communications emitters. Guardrail also provides location information on HF and VHF emitters.
> >
> > **(b) *Mission.*** Two or three aircraft normally are employed for each mission. These aircraft fly over friendly controlled areas in a standoff mode. The nature of the terrain, the anticipated location of target emitters, and the enemy AD threat dictate the distance behind the FLOT and altitude for each mission. Missions must be flown within range and LOS of target emitters. Also, aircraft must maintain LOS to each other. One aircraft must maintain LOS to the ground integrated processing facility.
>
> **(2) *QuickLook.***
>
> > **(a) *Capabilities.*** QuickLook is an electronic intelligence (ELINT) collection and emitter location system. It provides commanders with identification, location, and deployment of noncommunications emitters. QuickLook classifies and locates electronic emitters. A ground-based data collection and emitter location facility receives this information by digital data link.
> >
> > **(b) *Mission.*** Like Guardrail missions, QuickLook missions are flown in a standoff mode. Distance from the FLOT depends on the mission, terrain, and AD threat. Mission time depends on flight speed, altitude, and the distance from the airfield to the flight track.

b. *Aviation Brigade.* Within the division and corps, SEMA assets provide the commander with rotary-wing IEW capabilities. SEMA assets of the aviation brigade are EH-60 (QuickFix) helicopters. QuickFix aircraft are organic to all US divisions and armored cavalry regiments.

> **(1) *Capabilities.*** QuickFix can provide airborne communications intercept, direction-finding, and electronic countermeasures (ECM).
>
> **(2) *Mission.*** Within the division, the MI battalion exercises OPCON over the QuickFix aircraft organic to the division aviation brigade. This system employs enhanced radio line of sight (LOS). This LOS provides the division G2 and G3 with an extended VHF-intercept and VHF-jamming capability that reaches beyond brigade areas of operations into the division's deep operations area. QuickFix aircraft support the division's overall SIGINT collection and electronic battlefield templating to prepare for combat.

4-9. ADDITIONAL INTELLIGENCE GATHERING ASSETS

a. *Long-range surveillance unit/special operations forces.* LRSU and SOF personnel operate well forward in the division and corps areas. LRSU and SOF operations consist of small teams conducting reconnaissance and surveillance operations. Aviation commanders must be prepared to exploit these intelligence gathering assets when the opportunity arises. Real-time intelligence from these sensors can be transmitted directly to Army aircraft.

b. *Unmanned Aerial Vehicles.* UAVs are powered, aerial vehicles that do not carry human operators. UAVs use aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted remotely, can be expendable or recoverable, and can carry a variety of payloads. UAVs can provide real-time intelligence (photos or live transmissions) that are accessible to aviation commands and staffs. These systems are particularly effective when used to augment deep operations. They can

provide valuable information in hostile areas where the risk to a manned system might be too great.

4-10. AIR TRAFFIC SERVICES

Air traffic services (ATS) units offer a range of aviation combat support. ATS units provide services for US Army aviation, other US services, and allied forces. Commanders must integrate ATS employment into deep, close, and rear operations. FM 1-120 and FM 100-103 further describe ATS capabilities and coordination with A^{2}C^2 functions.

4-11. WEATHER SUPPORT

a. *Support Requirements.* Weather is critical to Army tactical operations. Its effects must be considered by every tactical unit during all operational phases: deployment, employment, maneuver, CS, and CSS. Continually changing atmospheric conditions make meteorological data highly perishable. Thus, weather observations and forecasts must be constantly monitored and updated so that they remain accurate and useful. Commanders must consider both favorable and unfavorable weather conditions to determine the best course of action for the mission. Aviation commanders and personnel-more than everyone else-depend on accurate weather data. Aviation can overcome the many drawbacks of terrain; however, weather influences the space in which aviation operates. Therefore, aviation requires direct weather support.

b. *Weather Teams.* The WETMs at all levels consist of a staff or an assistant staff weather officer and forecasters and observers. The teams provide 24-hour-a-day weather services.

(1) *Aviation brigade.* WETMs of the division and corps aviation brigade are configured with seven and eight personnel, respectively. The WETMs provide the aviation brigade TOC with weather support. Each team consists of an assistant staff weather officer, three enlisted forecasters, and three enlisted observers. Another officer will be added to the corps aviation brigade WETM to support the corps airfield. These personnel are to support corps aviation brigade operations and the facility that sustains fixed-wing assets of the corps command aviation battalion.

(2) *Echelons above corps.* EAC include those echelons within a theater. These echelons include joint, combined, and component commands. The Army component headquarters normally provides administrative and logistical support to USAF weather teams. However, an Army headquarters may be required for operational command between theater and corps. The size and organization of Army EAC vary with the theater. However, when employed, the headquarters requires weather support from the air weather service (AWS).

(a) An EAC WETM provides a staff weather officer on the commander's staff. It gives continuous (24-hour-a-day) forecasting support as well as continuous observation support at designated airfields.

(b) The EAC WETM serves as the center for weather support to a multicorps operation. Using centralized products from the AWS, the WETM prepares and tailors products (facsimile and teletypewriter) for the EAC commander and staff and subordinate commanders. Also, the team prepares finished weather products to support independent operations when these products are not immediately available from the AWS. These independent operations include those of the corps, division, separate brigade, and armored cavalry regiment (ACR).

(c) Subordinate to the EAC weather team are two Army airfield WETMs. These provide continuous observation and remote forecasting.

(3) *Corps.* The corps WETM operates in the CTOC area. The corps headquarters and

headquarters company (HHC) supports the HHC. The team serves as the Army force tactical forecast unit (TFU) when no higher echelon TFU is employed. It also provides direct weather support to the G2 and to the two corps airfields. The corps WETM gives guidance and assistance to the subordinate weather teams at division, separate brigade, and ACR. This support includes weather products that are tailored yet detailed enough to support division, separate brigade, and ACR operations. The team also functions as a hub for collecting and exchanging weather data and observations from subordinate WETMs within the corps area. The team operates weather-dedicated Army equipment. Vehicles, generators, and communications equipment (except high frequency (HF) radio teletypewriter (RATT) equipment) are included. The team also maintains other common table of allowances (CTA) equipment such as tents and heaters. The team functions 24 hours a day. It can observe weather and provide forecasting support to a tactical CP for limited periods. The corps weather team has an staff weather officer (SWO) and personnel who perform forecasting and observing. The aviation brigade weather team has an assistant staff weather officer (ASWO) as well as forecasters and observers.

(4) *Division.* The division WETM coordinates with the DTOC. The team receives support from the division HHC. It provides direct weather support to the G2 at the division TOC and to the division aviation brigade. The division team collects weather data and observations. It exchanges them among subordinate brigade and battalion S2 assets, the corps WETM, or other higher echelon forecasting agencies. Forecasts made by the division WETM are distributed to lower echelons by the G2 through the intelligence communications network. Like the corps WETM, the division WETM operates the weather-dedicated Army equipment. The team has a 24-hour-a-day capability to observe and forecast weather; it can support a tactical CP for a limited time. The division weather team contains an SWO as well as forecasters and observers. The aviation brigade weather team has an ASWO along with forecasters and observers.

(5) *Armored cavalry regiment and separate brigade*. The HHT supports the ACR, which operates in the TOC area. Separate brigade WETMs are supported by the HHC and also operate in the TOC area. Each team provides continuous weather support to the ACR or separate brigade TOC. It also can provide limited direct forecasting support to subordinate units engaged in special operations. The team operates and maintains weather-dedicated Army equipment. The ACR and separate brigade weather teams both have SWOs as well as forecasters and observers. FM 34-81 discusses weather support operations in detail.

c. *Weather Effects.* Weather is an important factor in planning aviation operations. Commanders need to analyze weather forecasts and consider weather effects before employing assets. Table 4-2 (below) briefly describes how different weather conditions can affect aviation operations.

Table 4-2. Weather effects on aviation operations

WEATHER ELEMENT	RESULT
Altimeter setting (barometric pressure)	Is required for altitude accuracy.
Pressure profile	Affects terrain avoidance.
Atmospheric electrification electrical storm	Is hazardous to in-flight, refueling, and arming operations.
Cloud cover and ceiling	Limit operations requiring aircraft clear of clouds. May preclude landings or increase danger during takeoffs. May preclude tactical air missions. May preclude firing of Hellfire missiles.

Pressure altitude	Affects engine performance.
	Affects engine efficiency calculations.
Dew point	Warns of possible fog formation or icing conditions.
Ice thickness	Affects selection of landing sites.
Icing	Affects aerodynamics aircraft (lift capability).
	Can preclude aviation operations.
	Can prevent aviation weapons system operations.
Precipitation	Affects visibility and safety of flight.
Snow depth	Affects ground handling.
	May preclude hover operations (powdery snow).
Visibility	Affects landing and takeoff capabilities
	Affects acquisition capabilities
	Increases flight hazards (low visibilities)
	Affects electro-optical target designation systems.
	Affects terminally guided munitions.
Surface winds	Affect aircraft control near the ground.
	Affect landing and takeoff.
	Affect ground speed for low-level flight
	Affect start up and shut down.
Winds aloft	Affect navigation
	Affect ground speed at higher flight altitudes.
Turbulence	Affects performance of reconnaissance and surveillance shear effect system.
	May cause aircraft structural damage.
	May affect aircraft control.
	Can preclude aviation operations (severe turbulence).
Refractive index	Affects radar, laser, and IR range-finding techniques.
Temperature	Reduces lift capability of aircraft (high temperatures).
	Can increase maintenance requirements and increase time to perform maintenance (cold temperatures).
	Can reduce number of personnel carried because of weight and bulk of protection gear (cold temperatures).
Illumination	Affects some night vision devices.

4-12. SIGNAL SUPPORT

a. *Communication System.* Commanders stress dispersion, mobility, and flexibility in employing tactical units. Unit commanders must have a continuous, flexible, and mobile communication system to support these operational concepts and to have the necessary C^2. The corps and division area communication system achieves these aims. Within the division, the signal battalion establishes and operates the division area communication system for the division command echelons to provide communications to subordinate units. Communications are established to each brigade headquarters. Mobile subscriber equipment (MSE) communications support will be provided more on an area basis than on a habitual common-user basis. Within the division, communications also include tactical satellite, single-channel radios, Enhanced Position Location Reporting System (EPLRS), and area messenger service. FM 11-50 explains division combat communications in detail.

b. *Aviation Brigade Communications Capabilities.* Communications within the division aviation brigade differ little from those within the corps aviation brigade. The aviation brigade depends heavily on single-channel voice radios because of the mobility of the units of the aviation brigade. Other types

of communications used by the aviation brigade include multichannel systems, wire, messenger service, and heliborne C^2 and SATCOM when available.

(1) *Single-channel radio.* FM and amplitude modulated (AM) single sideband (SSB) voice radios are types of single-channel radios organic to the aviation brigade. The aviation brigade may also receive tactical satellite systems. Single-channel radios are the chief means of communication below brigade level. They supplement the division multichannel system at brigade and above. Aviation units also have airborne ultra high frequency (UHF) and very high frequency (VHF) radios in their aircraft for internal C^2.

(2) *Area common user system.* The ACUS network is built around area signal nodes and extension nodes. Area signal nodes serve a geographic area. Extension nodes are signal assets from the signal battalion that supports unit headquarters or CPs. Teams of signal personnel who control these nodes form a habitual relationship with the users, but receive all technical control from the area signal nodes.

(3) *Wire.* Wire communications are used mainly for the unit's internal communications network.

(4) *Messenger service.* Messenger service is provided by the corps/division G3. The aviation brigade may have to operate its own internal messenger service; it may also be tasked to support the division with aerial courier and messenger support.

(5) *Heliborne command and control.* In addition to ground signal support, the aviation brigade requires a heliborne C^2 capability. Each brigade has one or more command aviation companies in it's command aviation battalion, general support battalion, or assault battalion to provide this support to the corps, division, and/or brigades.

(6) *Mobile subscriber equipment.* The MSE system is the backbone of corps and division communication systems. MSE is the common-user area communication system for all US Army corps and divisions. MSE integrates the functions of transmission, switching, control, communications security (COMSEC), and terminal equipment (voice and data) into one system. MSE provides the user with a telephone facsimile communication system extended by mobile radiotelephone and wire access. Users can communicate throughout the battlefield in either a mobile or a static situation. MSE can be described by five functional areas: Area coverage, wire subscriber access, mobile subscriber access, subscriber terminals, and system control.

(a) Figure 4-1 shows the MSE network as integrated within the corps and division force structures. The MSE system covers the corps rear boundary forward to the division maneuver battalion rear area. The corps MSE system typically covers an area of 37,500 square kilometers (kms) (15,000 square miles). Node centers (NCs) connect extension switches and radio access units (RAUs). Extension switches allow wire line terminal subscribers (telephone, facsimile, and data) to enter the communication system. RAUs allow mobile radiotelephone users to communicate with other systems. The system control centers allow current information to be entered into the network management system. The MSE system is a nodal-switched system extended by radiotelephone.
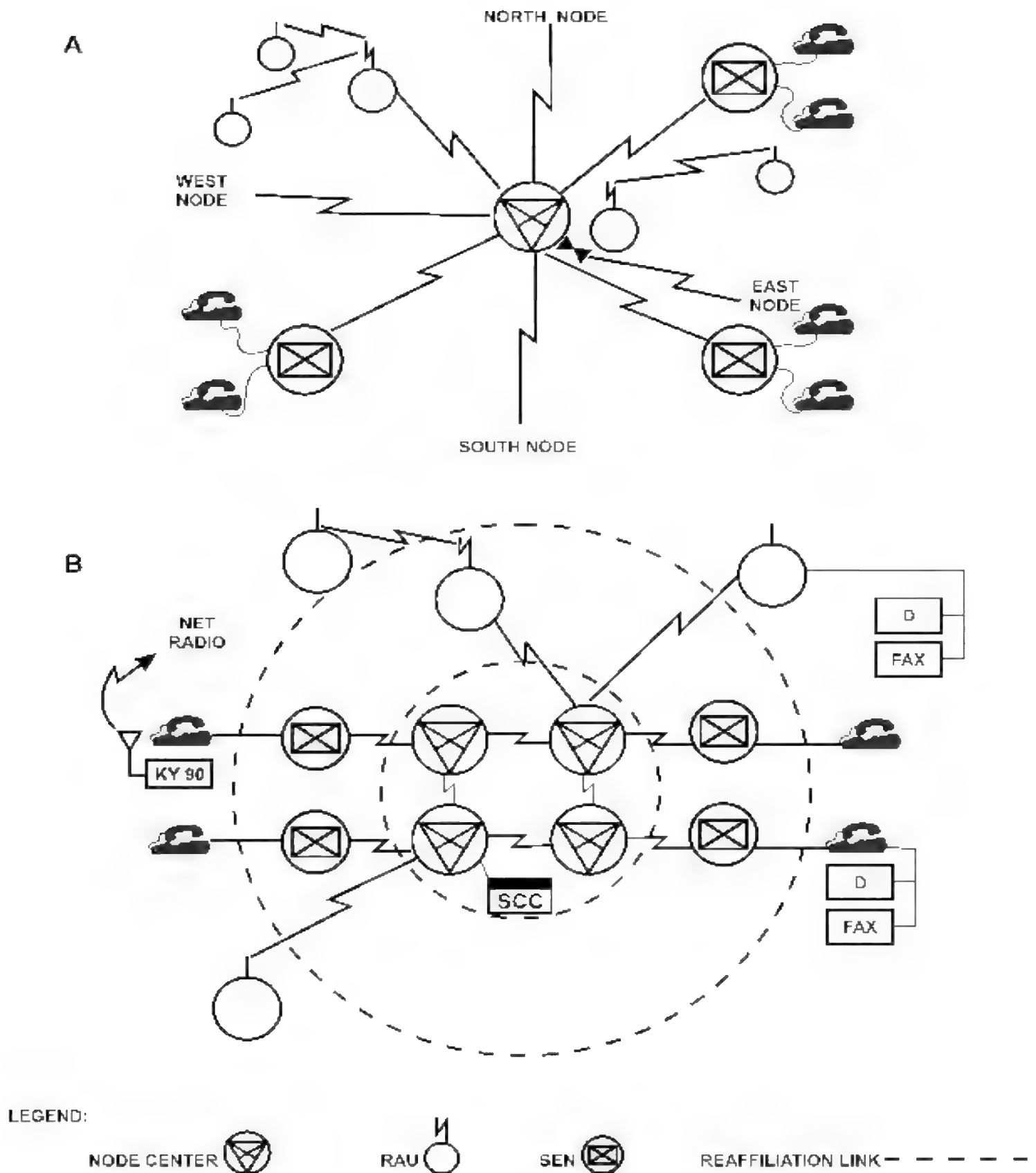
Figure 4-1. MSE network as integrated within the corps and division force structures

(b) The MSE architecture supports area common-user communications requirements on a dynamic and integrated battlefield at corps and division. Requirements include network

survivability under damage and overload conditions and self-adjusting routing during both changing load patterns and location of subscribers (Figure 4-2).

37 of 42 NODES DEPLOYED
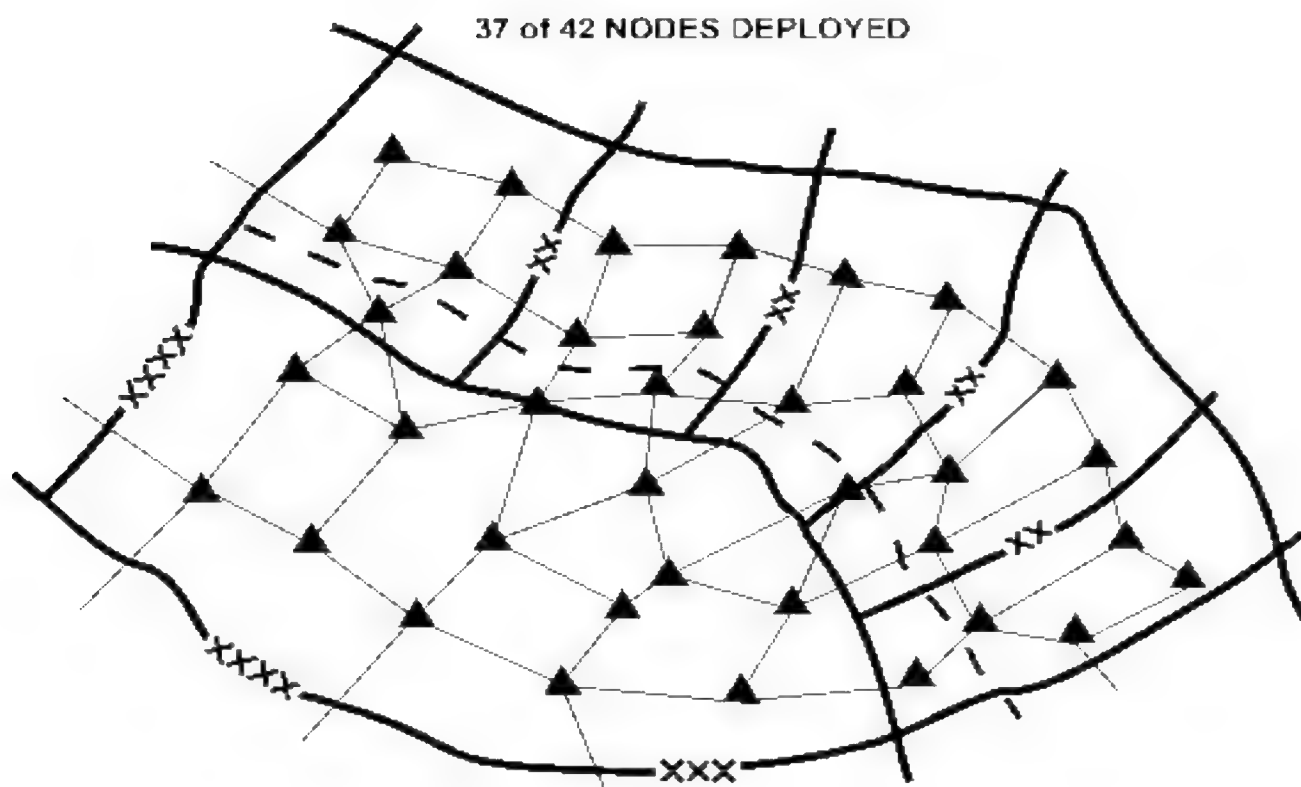
Figure 4-2. MSE architecture in support of the corps or the division

(c) MSE has two major roles. First, it furnishes CP communications from brigade back to the corps rear area. Second, it furnishes mobile radiotelephone service for high-priority users forward into the maneuver area. MSE enhances CP movement; it provides continuous telephone service to users with mobile subscriber radiotelephones during movement. CP setup and teardown times are greatly reduced because wire and cable requirements are reduced. The RAU provides a communications link through other NCs when CPs relocate. The currently fielded communication system without MSE technology cannot respond to the fluid battlefield in today's threat environment; however, MSE will provide continuous and in-depth communications, particularly during force and CP movement.

(d) Figure 4-3 shows a typical MSE system deployed in a division. FM 11-50 describes the system in more detail.

(e) Eventually, the MSE is envisioned as the primary communications means for C^2 support systems such as the manuever control system/PHOENIX (MCS/P). The MCS/P will provide automated support to maneuver commanders from corps through battalion. The purpose of MCS is to enhance and shorten the information acquisition portion of the decision-making cycle. Also, the MCS/P will improve the means of directing and synchronizing subordinate and supporting units and aid in selecting courses of action.
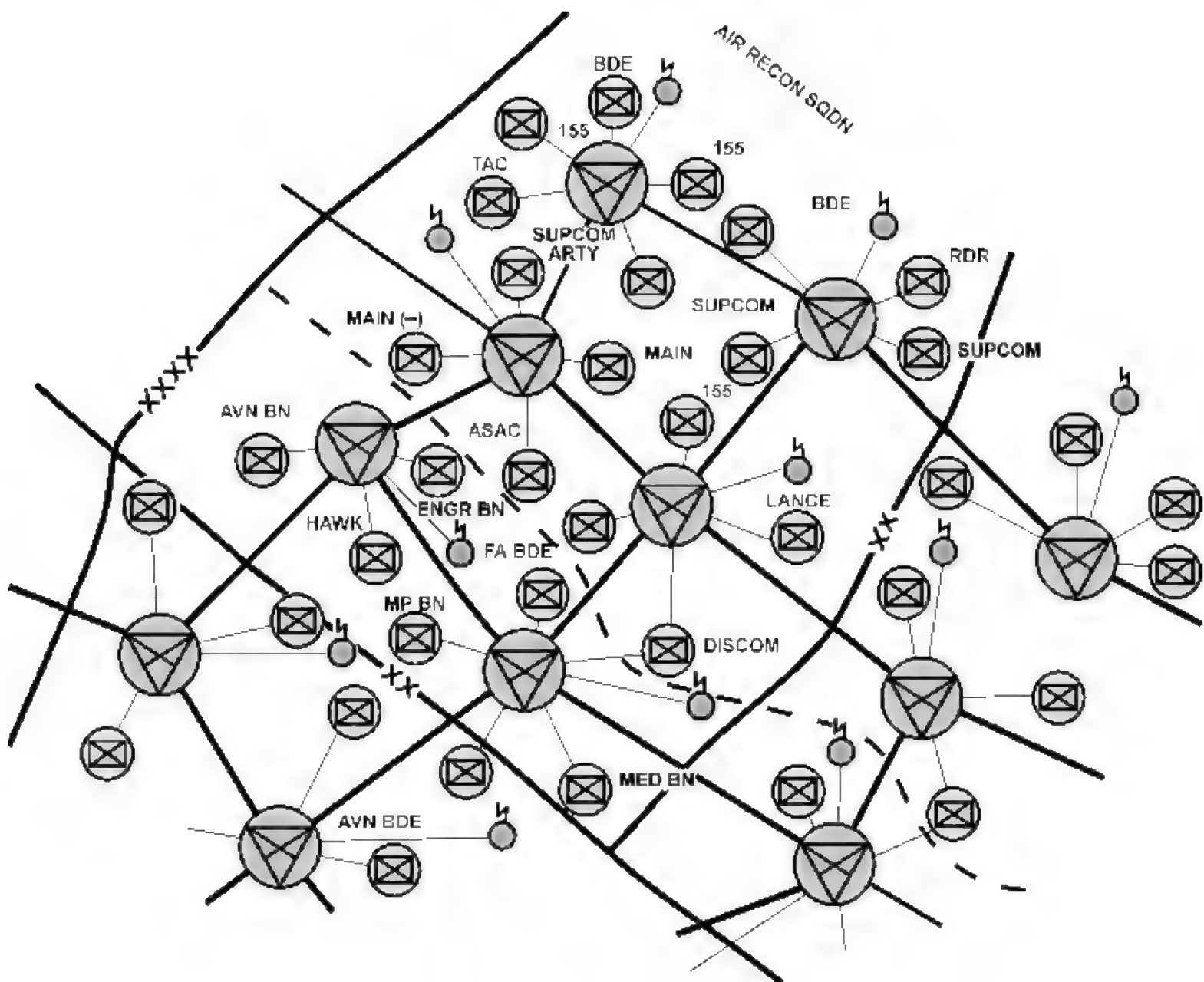
Figure 4-3. Typical MSE system deployed at division

4-13. MILITARY POLICE SUPPORT

a. *Operations.* Military police (MPs) perform MP missions critical to the success of the tactical comm ander's intent and concept of operation. MPs expedite movement of combat resources on MSRs leading into rear areas and patrol their area of operations to protect critical locations and facilities. They also evacuate enemy prisoners of war from forward areas and conduct law-and-order operations when directed to do so. FM 19-1 discusses MP operations in more detail.

b. *Battlefield Missions.* Military police have four battlefield missions: battlefield circulation control, area security, enemy prisoner of war (EPW) operations, and law-and-order operations. Each mission is composed of a number of operations. The operations can be done independently or combined to accomplish the missions. The specific operations MP units perform at a given time are determined by the tactical commander's need and the availability of MP resources. Because MP resources are limited, all assets are committed at all times.

(1) *Battlefield circulation control.* BCC, a main MP mission, helps move military traffic along the MSRs smoothly, quickly, and with little interference. For BCC, MP reroute traffic to meet changes in tactical situations, enforce MSR regulations, and reconnoiter primary and alternate MSRs. MPs control refugees and stragglers. As MPs perform these missions, they collect and report information on the friendly and enemy situations. They monitor road and traffic conditions; they also report on the status of key terrain influencing the military road network. All of these MP actions help the maneuver commander move his people and supplies where and when he needs them.

(2) *Area security.* MPs protect designated facilities, units, convoys, MSR critical points, and people from enemy activity in the rear area. They also conduct area reconnaissance to gather and document information about enemy activity in the rear area.

> **(a)** MPs conduct rear operations to identify, intercept, and destroy small enemy forces before they can close on their objective. MPs normally are designated as a response against Level II threat attacks on bases and units that cannot defeat the enemy without assistance as described in paragraphs 3-17, 3-21, 3-25, and 3-35. MPs also respond to Level III threat forces. MPs determine the size and intent of Level III threat forces, delay and disrupt their progress as much as they can, and hand over the battle to a tactical combat force (TCF). MPs are ready to stay and help TCFs defeat the threat force.

> **(b)** MPs perform area damage control operations to reduce the damage caused by hostile actions or natural and man-made disasters. They provide support that includes, but is not limited to BCC, refugee control, straggler control, NBC detecting and reporting, and some local physical security when required.

(3) *Enemy prisoners of war.* MP EPW operations control the flow of EPWs from their capture to their internment in prisoner-of-war camps. MPs in a division MP company operate division forward EPW collecting points in each brigade. They evacuate EPWs captured in the main battle area (MBA) from the division forward EPW collecting points and also operate the division central EPW collecting point. MP company members from the corps evacuate EPWs from division central EPW collecting points and operate the corps EPW holding area.

(4) *Law and order.* MP law-and-order operations, if needed, provide police services on the battlefield. These services include investigating criminal offenses, performing law enforcement operations, and confining US military prisoners. FM 19-1 describes MP support in more detail.

4-14. CHEMICAL SUPPORT

Chemical units reduce the effects of enemy nuclear, biological, and chemical (NBC) weapons on combat operations. These units focus on smoke, NBC reconnaissance, and decontamination operations. The brigade chemical officer advises the commander on NBC defense procedures, the employment of smoke and flame, reconnaissance, and decontamination assets. As described in chapter 2, chemical units can provide NBC reconnaissance, equipment decontamination, and smoke support to the brigade. Chemical units provide hasty, and deliberate, smoke to supported units; conduct decontamination operations; and provide NBC reconnaissance support.

Chapter 5

Combat Service Support

This chapter gives an overview of the combat service support (CSS) system. It explains how aviation brigades coordinate for elements of the system. Aviation operations require a great deal of sustained logistics support. Rotary-wing and fixed-wing assets use vast quantities of CSS, particularly fuel and ammunition. They are also one of the primary suppliers of critical CSS to both ground and aviation units. Aviation brigades at division, corps, and echelons above corps (EAC) levels provide both routine and emergency movement of all classes of supply throughout the commander's battlespace. Their assets are not constrained by clogged resupply routes, rugged terrain, or lack of a modern road structure. This makes these brigade assets equally useful during both stability and support (SASO) and combat operations. CSS elements that support aviation brigades include supply, maintenance, transportation, personnel, and field services.

SECTION I. Logistics Principles

:

5-1. CSS PLANNING

The planning required to provide CSS depends on mission, enemy, terrain, troops, and time available (METT-T) and the intensity of the mission. For SASO the staff officers need time to task-organize the CSS base. They also need time to coordinate the use of storage facilities, the transport of personnel and equipment, and the development of a workable logistics system. As a rule, CSS and logistics requirements become increasingly standardized as the intensity of the mission increases. As support requirements become standardized, less time is needed for planning. However, each mission still requires time for planning support. Threat doctrine recognizes the importance of logistics support to aviation. Threat forces employ units to locate aviation support organizations. They know that destroying these organizations will render aviation assets combat ineffective. Threat forces also recognize that many friendly operations depend on aviation employment against threat armor, air defenses, and logistics support bases.

a. *Planning CSS Organization.* Aviation brigade units normally employ their CSS assets in echelons. Careful planning is required to ensure the success of this concept. CSS must adequately support forward-deployed aviation units. The battalion air lines of communication (ALOC) are considered the combat trains of most units. Division, corps, and theater aviation place their CSS to achieve the best support of their units. Normally, logistical assets are task-organized to support the mission. Command and staff sections position themselves where they can best execute the logistics plan. Each trains or support location contains the minimum number of personnel required to provide support, supervise personnel, and provide security. Paragraph 4 and the logistics annex of the operation order (OPORD) also address the support requirements and responsibilities of supported units. The use of SOPs and OPORDs identifies the capabilities of supporting units to supported

units. Because of the complex and unique nature of aviation support, standing operating procedures (SOPs) and the use of the logistics annex are essential. SOPs should be continuously updated to clarify procedures for routine-

- Resupply.
- Maintenance.
- Transportation.
- Field services.
- Health services.
- Personnel services.

b. *Planning Responsibilities.*

(1) CSS organizations require-

(a) A clear understanding of both the supported commander's and the CSS commander's responsibilities.

(b) Familiarity with the responsibilities and capabilities of the higher, subordinate, and adjacent elements.

(c) Close contact and information exchange among these elements.

(2) CSS planning is a command responsibility. The commander-

(a) Weighs CSS considerations in deciding courses of action.

(b) Ensures that operational planners are informed of logistical capabilities and the logistics planners are kept informed of current and future plans.

(c) Directs that equipment issued to units or organizations be in serviceable and combat-ready condition.

(d) Enforces proper equipment use, accountability, and maintenance.

(e) Considers personnel readiness, replacement availability, and personnel loss estimates.

(3) The executive officer (XO) is responsible for administrative and logistical planning. He-

(a) Supervises the logistics support.

(b) Ensures that subordinate units prepare and forward administrative and logistical status reports.

(c) Integrates all staff sections so that staff members understand their responsibilities.

(d) Keeps the commander informed on materiel readiness.

(4) The commander, S3, and S4 must understand the capabilities of their supporting

units. Many commanders develop alternate plans that allow for mission completion without overextending their supporting units. These plans reduce planning time because corrective actions-such as augmentation or task organization-are identified in the OPLAN before it is executed. The XO and S4 plan for each operation; they ensure adequate support is at the proper place at the proper time. Much of the logistics support must be coordinated before it is included in the OPLAN. The commander and his staff follow up often on the status of CSS assets so that support is provided as planned. CSS planners must anticipate requirements and integrate them into the OPLAN. They must plan for a responsive system that can provide continuous support; they must improvise when necessary.

c. *Planning Principles.* The tenets of aviation doctrine-initiative, agility, depth, versatility, and synchronization-are basic to successful operations. They also establish the framework for organizing logistics. An effective and efficient logistics system allows the aviation brigade to operate according to these tenets. CSS planners embody the precepts of continuity, anticipation, integration, responsiveness, and improvisation. There is no time to react to decisions and circumstances. Support is provided when, where, and in the quantities required. CSS planners should be flexible enough to respond rapidly to the commander's needs, not just to his orders. They must understand the commander's intent, as well as his orders, and must act to support his intent.

(1) CSS planning consists of the continuing and essential functions that support the mission and provide responsive logistics support to the supported force. CSS commanders and planners must know and understand the tactical mission and plans. After analyzing the tactical concept of operations, CSS commanders and planners must be able to predict support requirements. CSS planners must sustain the operation so that the commander can achieve the tenets of doctrine. They determine the type and quantity of support required and the priority of support by type and by unit.

(2) CSS planning is neither static nor finite; it has to accommodate the requirements of the supported force during all phases of the operation. The availability of critical supplies and munitions may decisively influence combat operations. Therefore, CSS planners must act on-rather than react to-support requirements.

d. *Deception Planning.* CSS assets and supplies also are required to support deception operations. Pre-positioning CSS assets at false locations is an excellent deceptive tactic. To aid the deception, personnel can use false containers and equipment to hide the real equipment. Deception operations are difficult to plan and execute. However, they enhance the element of surprise and further exploit the capabilities of aviation. Deception operations must be rehearsed and executed often according to the higher commander's intent. Support can be provided in more than one way. Innovative thinking and frequent training exercises-coupled with logistics wargaming simulations and artificial intelligence decision modeling-will improve the formulation of logistics requirements. CSS requires flexibility and responsiveness. The S4 must grasp the complex support requirements of aviation. He provides the support that enables the commander to integrate his assets into the scheme of maneuver.

e. *Tactical Planning.* The tactical plan and CSS plan are developed concurrently. Thus, tactical and CSS planners must establish communications links with each other. Normally, the tactical plan or concept of operation is not finalized until CSS planners have determined the supportability of proposed courses of action and have been allowed the opportunity to provide alternatives. When the supported force concept has been determined, the CSS planning requirements are projected and plans are developed to satisfy those requirements.

f. *Planning Analysis.* When planning the support of operations, CSS planners are continuously involved in risk analysis of various options. Detailed SOPs aid this process by allowing management by exception. The planning becomes easier as the unit builds historical data on supply expenditures and requirements. Contingency plans are also formulated to handle expected future courses of action. These plans reduce the time required to react to changing battlefield support requirements. Planners always have to balance the benefits of a support concept against the risks involved in the support provided; for example, deciding the location of the support areas. For each operation, commanders and CSS planners assess the situation, measure the risk, and select the best course of action. They recognize that every possible action has a degree of risk. After a course of action has been selected and the risk analysis is completed, detailed planning occurs before the operation is executed. The planning includes determining-

- What support is required.
- Where the support is needed.
- What quantity of support is required.
- Who provides the support.

5-2. CSS ORGANIZATION

On the battlefield, the organizations that provide CSS are varied and become more complex with each higher command level. CSS forces at corps and higher level are organized using a building block concept. The support force is tailored in size and variety to meet the needs of the force that it supports. At the division, the CSS force is structured based on standard table(s) of organization and equipment (TOEs) for similar units. These structures are tailored to the METT-T. Elements of these organizations locate where they can best fulfill their mission.

a. *EAC Support Command.* The Army Service component commander (ASCC) is the senior Army operational-level commander assigned to a unified command. The size of the EAC support command is tailored to mission demands; it varies from one theater to the next. The EAC support command is a flexible organization that commanders can tailor to provide support across the entire range of military operations. This support may include support functions previously performed by functional commands under the theater Army. Critical elements of the EAC support command can deploy rapidly into an area of operations (AO) to support entry operations and enhance the theater base's capability to receive and move forces forward. The tailored nature of its structure minimizes strategic lift requirements by allowing the commander to deploy only essential support elements. As much as possible , the EAC support command uses split-base operations by only deploying those elements of an organization actually required in the theater.

(1) Operational functions of the EAC support command may include-

- Receiving forces.
- Equipping, marshalling, staging, and moving units forward in tactical assembly areas.
- Providing sustaining and reconstitution support to the Army force (ARFOR).
- Helping establish and adjust theater lines of communications (LOCs).
- Providing integrated materiel management and movement control to perform all other operational logistics functions.
- Coordinating projection of support assets from continential United States (CONUS) or intermediate staging bases.

(2) Operational elements of the EAC support command are assigned or attached to meet the minimum essential support capabilities required for the operation. Capabilities may include:

(a) *Petroleum*-receipt of products in theater, distribution throughout the communications zone (COMMZ) and rear of the combat zone, and quality surveillance.

(b) *Ammunition*-port-level accountability and management, storage in the COMMZ, distribution to corps storage areas and ammunition supply points (ASPs), and issue to units operating in the COMMZ.

(c) *Transportation*-mode support, terminal operations, and cargo transfer.

(d) *Personnel support*-postal operations; replacement management; legal service support; command information; morale, welfare, and recreation (MWR); and personnel information management.

(e) *Military police*-circulation control, EPW, civilian internee operations, law enforcement, and area security.

(f) *Explosive ordnance disposal*-theater-wide support.

(g) *Civil affairs*-populace and resource control, foreign nation support, humanitarian assistance, military-civil actions, civil defense.

(h) *NBC support*-smoke, NBC reconnaissance and decontamination and large area biological alert detection to the command.

(i) *Area support*-to elements in the rear, including control of rear operations.

(3) The EAC support command includes both Active Army and Reserve components. It typically includes a central distribution management activity, a variable number of area support groups (ASGs), a logistics support element, and functional units required to provide support to all Army elements in the theater. Elements will be arranged with other elements as appropriate to provide flexibility. The commander will tailor the support structure to meet changing requirements.

SECTION II. Army Logistics Support Groups, Elements, And Commands

5-3. LOGISTICS SUPPORT GROUP

An area support group (ASG) is a tailored logistics organization in the COMMZ. It is subordinate to the EAC support command. It serves as a subordinate C^2 element for the EAC support command with an area responsibility for supply-including petroleum support-field service support-including water purification and mortuary affairs-and maintenance-including aviation intermediate maintenance (AVIM). It provides NBC warning and reporting and controls rear operations in its assigned area. The ASG may include other capabilities to fulfill designated theater support responsibilities. Though it has no fixed structure, it may include civil affairs, supply and service, petroleum supply, and organize multifunctional logistics organizations to provide support for specific missions or organizations.

5-4. LOGISTICS SUPPORT ELEMENT

a. The logistics support element (LSE) is a flexible table of distribution and allowances (TDA) organization. It provides limited general support (GS)/commodity and depot-level logistics. It has a small peacetime cadre with the bulk of the positions being battle roster. The LSE may be under the operational control of the commander-in-chief (CINC). It usually is attached to the EAC support command. Its elements will retain technical lines with their major commands. The EAC support command commander will identify requirements and assign tasks and priorities to the LSE. The LSE will be rapidly deployed. Its structure will evolve during the course of the operation to adapt to changing requirements and capabilities of deployed organizations. The LSE can shorten the logistics pipeline by providing the same support in theater that AMC provides in the continential United States (CONUS).

b. Functions that the LSE may perform include:

(1) Receipt, storage, issue, and retrograde and redistribution of high-dollar, high-tech, low-density items and selected maintenance items.

(2) Limited commodity and depot-level maintenance to return items to the support system or to support the reparable exchange program. Capabilities include flexible, modular commodity weapon system-oriented teams from CONUS depots, and organic or contractor forward repair activities. The senior Army logistician will identify maintenance requirements to the LSE. The LSE assigns work loads to the attached and operational control (OPCON) maintenance units and activities.

(3) Depot-level maintenance in support of the theater aviation maintenance program.

(4) Technical, logistics, training, and other specialized services for theater ammunition functions.

(5) Logistics software management.

(6) Oversight of contractor-operated activities in the theater through the contracting officer's representative and administrative services to the representatives.

(7) Linkage between the theater and the technology base and other research, development, test, and evaluation (RDTE) resources. The LSE provides concrete assistance through interim materiel modifications, operational suggestions, and battle damage assessment report (BDAR).

(8) Army Oil Analysis Program support.

5-5. CORPS SUPPORT COMMAND

a. A corps support command (COSCOM) normally supports from two to five divisions. To support this varied number of forces, the corps support forces are tailored. The number and types of CS and CSS units vary with the number and types of divisions attached to the corps. Thus, CSS units are organized on the building block concept; existing companies are formed into units (battalions and groups) to assemble support. The COSCOM provides GS to divisions and direct support (DS) and general support (GS) to nondivisional units within the corps.

(1) *Materiel management center and movement control center.* The two major functional control centers within the COSCOM are the materiel management center (MMC) and movement control center (MCC). The MMC integrates supply and maintenance management of all GS-level supplies and maintenance within the corps. The MCC-

(a) Provides routine management for all transport or movement within the corps.

(b) Maintains the road network and traffic circulation plan.

(c) Allocates transportation assets throughout the corps.

(2) *Personnel services unit.* The personnel group sustains corps (or EAC) personnel readiness. It also manages critical systems and synchronizes the corps personnel network. This unit normally is a personnel group. The personnel group provides personnel support to assigned or attached tactical personnel units. It also task-organizes and deploys assigned personnel units to meet the situation. The personnel group provides liaison with divisions, corps, and the personnel command to fulfill all support requirements.

(3) *Medical units.* The medical brigade also is a tailored organization. Its units provide hospital, dental, psychiatric, laboratory, preventive medicine, and veterinary services. These units are assigned to a medical brigade or group. This brigade or group contains hospital units; ambulance units, both ground and air; and medical supply units.

(4) *Transportation units.* Normally, this is a transportation group. It works closely with the MCC to control transportation assets throughout the corps. The group focuses on corp wide transportation support of operations. It may include units

performing both mode and terminal operations. A transportation group normally is required when the corps performs both tactical and operational transportation mode and terminal support. This may occur during the initial deployment of the corps when port opening and line haul transportation units are attached to the corps to perform functions normally associated with operational logistics.

(5) *Supply and maintenance units (less Classes III and V)*. Normally, supply and service battalions and maintenance battalions are organized under a support group. A typical COSCOM has two forward support groups. These provide DS and GS and maintenance support to divisional and nondivisional units. The COSCOM also has one rear support group that provides DS and GS to the corps. The support group itself is a flexible organization; its size varies according to the size of the force it is supporting.

(6) *Ammunition units*. Normally, an ammunition group is assigned to each COSCOM. The group provides technical direction and C^2 for both GS and DS companies. This group operates the corps storage areas and ASPs and also supports the ammunition transfer points in the divisions. They normally are augmented with theater Army (TA) assets for handling special ammunition.

(7) *Petroleum units*. Normally, these units are petroleum battalions. These units have their own Class III bulk-hauling capability. They support divisional and nondivisional units with bulk Class III line-haul. They also provide the corps with Class III bulk storage and distribution. When augmented, these units can perform terminal transfer and pipeline or rail operations.

(8) *Civil affairs units*. Normally, a civil affairs company is assigned to each COSCOM. It manages refugee control and helps coordinate host nation support.

(9) *Explosive ordnance disposal units*. Normally, an explosive ordnance disposal (EOD) control team is assigned to the COSCOM. This team has subordinate EOD detachments; these detachments provide EOD service throughout the corps area to reduce hazards from unexploded ordnance.

(10) *Finance units*. Corps finance units are part of a finance group. The commander has staff responsibility-as well as technical supervisory responsibilities-for all pay functions in the corps. The commander also has C^2 for finance support units (FSUs) assigned or attached to the corps.

(11) *NBC reconnaissance and decontamination units*. Chemical units conduct decontamination. They may assist in unit sustainment decontamination operations. These units provide radiological monitoring. They clear and decontaminate critical areas to the extent possible. If possible, they also clear and decontaminate equipment before removing it from the battlefield.

(I2) *Mortuary Affairs units*. The mortuary affairs (MA) units provide C^2 for from two to five companies. They establish collection points and process remains. The MA units establish, operate, and maintain military cemeteries. They also conduct area search and recovery operations.

b. Specific corps support group missions are listed in the COSCOM OPORD. The TOE for the corps support group (CSG) headquarters and headquarters company (HHC) is the same for forward and rear CSGs; however, basic missions of the CSG depend on whether it is employed in the forward or rear portion of the corps rear area. Subordinate CSG units supply weapons and ammunition to sustain the aviation brigade.

(1) ***Forward-employed CSGs.*** Forward-employed CSGs provide-

(a) Support to nondivisional corps forces operating in a committed division's area of operations (AO). Instead of returning to supporting units in the corps rear, the aviation brigade would be supported by logistics units or teams assigned or attached to forward CSGs and employed in the division support area (DSA).

(b) Area support to units behind the division's rear boundary. Support requirements vary as units move into and out of the CSG's area. Thus, the correct range and quantity of authorized stockage list (ASL) stocks are difficult to determine. Therefore, the COSCOM MMC requires intensive stock management.

(c) Backup support to the committed division. The amount of support depends on the type of division; the greatest amount normally is required for light infantry divisions.

(d) Support for a deep attack. Support requirements depend on the depth and length of the attack and whether ground LOCs are secure.

(2) ***Rear CSG.*** The rear CSG provides-

(a) Area support to units employed in or passing through its AO, to include divisions in reserve, separate brigades, and armored cavalry regiments (ACRs).

(b) Backup support to forward CSGs.

(c) Corps wide GS supply. For example, Class III (B) fuel normally is transported by throughput distribution to the division aviation brigade.

(d) Resources for reconstitution of degraded units.

(3) ***CSG allocation.*** The number of CSGs employed by the COSCOM depends on the-

(a) Number and type of divisions committed.

(b) Number and type of corps nondivisional units supported.

(c) Number of subordinate battalions requiring C^2.

(d) Extent of host nation support available.

(e) Corps assets required to support a contingency or a deep attack.

(f) Factors of METT-T.

c. The COSCOM includes one rear CSG as well as one forward CSG for each committed division. There is no set structure for either type of CSG. FM 54-30 gives detailed information on both the CSGs and their subordinate centralized support bases (CSBs). Each CSG supports units operating in the forward portion of the corps rear area. Another CSG is allocated according to COSCOM. This rear CSG provides area support to units in or passing through the rear portion of the corps rear area. For a five-division corps with three divisions abreast, this equates to four CSGs per mature corps. If there are more than three organic divisions, a CSG supports more than one division. Depending on the intensity of battle and the number of subordinate battalions, a CSG with six or seven subordinate battalions may support two divisions.

(1) *Area of responsibility.* The COSCOM commander assigns forward-oriented CSGs an area of responsibility along the corps frontage behind the committed division rear boundary. He adjusts those areas of responsibility based on the density of supported units, intensity of combat, and forward or rear movement of division boundaries. He also assigns an area support sector to the rear CSG. That sector may encompass an area from the rear of forward CSGs to the rear boundary of the corps.

(2) *Task organization.* There is no standard CSG organizational structure. CSGs can provide command, control, staff planning, and supervision for from three to seven of the subordinate battalions. The number, type, and mix of subordinate elements vary based on force modernization and the tactical support situation. The COSCOM assistant chief of staff (ACofS) for security, plans, and operations will task-organize CSGs based on support mission requirements. In low-intensity conflicts, units normally employed in the communications zone (COMMZ) may be assigned or attached to a CSG. As the number and type of supported units change, CSGs change the way in which their subordinate battalions are organized to provide support. Thus, a CSG employed forward in support of nondivisional corps units operating in a heavy division AO differs from a CSG employed forward in support of a committed air assault division. CSGs task-organize subordinate battalions by assigning or attaching logistics units to provide the required support. When the supported division is relieved, the CSGs task-organize their assigned or attached logistics units to more effectively meet the requirements of the incoming division.

(3) *Aviation maintenance battalion (AVIM).* An aviation maintenance battalion (AVIM)) normally is assigned to each COSCOM. The COSCOM may assign the aviation maintenance battalion (AVIM) to the rear CSG for employment near a fixed facility. AVIM units are further described in this chapter and FM 1-500.

d. To enhance the ability to tailor logistics forces, force developers will pursue opportunities to develop modular logistics elements. Modularity will provide force elements that are interchangeable, expandable, and tailored to meet the changing missions and needs of the committed force. Modular units will combine the assets required to provide a support

function or group of related functions. A module can be sent to support a deploying force without adversely affecting the ability of its parent unit to function at a reduced level.

5-6. DIVISION SUPPORT COMMAND

a. The division support command (DISCOM) provides division-level logistics to all organic and attached elements of the division. DISCOMs consist of a headquarters and MMC, three forward support battalions (FSBs), a main support battalion, and an aviation support battalion (ASB) or an AVIM organization. The base of operations for the headquarters, MMC, and main support battalion (MSB) is the DSA. However, under a split-based arrangement, components of the MMC may remain at their home station. A corps support battalion also typically operates in the DSA. It supports nondivision elements operating in the division area. In addition, certain combat support units may locate in the DSA. These may include signal, military police, engineer, and chemical *elements*. The DSA normally is located in the division rear adjacent to air landing facilities and main supply routes (MSRs). FM 63-2 is the doctrinal manual for heavy DISCOMs, while FM 63-2-1 addresses light DISCOMs. The MSB of heavy DISCOMs is discussed in FM 63-21. The ASB manual is FM 63-23**.**

b. The DISCOM has six major functions. They are-
- Supply.
- Maintenance.
- Transportation.
- Health services.
- Personnel services.
- Field services.

c. The DISCOM provides logistics support through three methods-unit, area, and task support. Unit support is furnished to a designated unit or group of units. Command relationships for these units normally include OPCON, DS, and GS. Area support is furnished to all units within a designated geographic area. Task support is a type or an amount of a unit's support that is furnished to designated units or an area so that the unit can accomplish identified tasks.

d. Maintenance, supply, transportation, and medical assets are organized to form three forward support battalions and one main support battalion. The HHC and the division materiel management center (DMMC) are combined into one element.

e. The forward support battalion (FSB) has an HHC and a coordinating and technical staff, a supply company, a maintenance company, and a medical company. The FSB is organized to support a brigade-size force. With augmentation, each FSB can support other divisional units operating in the area such as signal, engineers,or military intelligence. Currently, the same concept is employed within the air assault and airborne divisions except that tailored support assets are referred to as forward service support elements (FSSEs). Forward area support coordinators (FASCOs) serve the same function in an FSSE as the HHC of an FSB.

(1) *Supply company.* The supply company operates an ammunition transfer point (ATP). At that point ammunition for all divisional units operating in the area is transferred from corps or division transportation assets to unit resupply vehicles or aircraft. Also, this company establishes and manages a Class I ration breakdown point; a Class II, IV, and VII issue point; and a forward Class III distribution point.

(2) *Maintenance company.* The maintenance company provides DS maintenance and backup unit maintenance support such as evacuation. Also, it may be augmented with maintenance support teams from the corps or divisional main support battalion (MSB) assets. These teams are weapon-system specific; they are assigned based on the type and mix of battalions assigned to the brigade.

(3) *Medical company.* The forward medical company consists of a company headquarters, an ambulance platoon, and a trauma treatment platoon with a 40-patient holding capability. The company provides both unit (Level I) and divisional (Level II) health service support. This company also has a limited capability for resupply of Class VIII items.

f. The MSB supply element provides supply support for units in the division rear. It also maintains the division's reserve supplies (classes I, II, III, IV, and VII) to support the FSB and division aviation support battalion (DASB) supply companies with supplies that can not be throughput to forward areas. It provides water purification and supply as well as salvage collection service. MSB maintenance companies perform division-wide maintenance tasks. The number and types of companies vary with the type of division. They provide field maintenance for division units in the division rear. They also provide support beyond the capabilities of the FSB or DASB maintenance companies. Besides their base operations in the DSA, they provide teams to work in the areas of supported units as needed. The main MSB functions are depicted below.

(1) *Headquarters and headquarters detachment.* The headquarters and headquarters detachment includes a coordinating and technical staff.

(2) *Supply and service company.* The supply and service company provides receipt, temporary storage, and issue of Class I, II, IV, and VII supplies except aircraft, maps, airdrop, and rail supplies. It can store and issue 299,000 gallons of bulk POL per day (to include a 1-day supply of JP8). It also can operate an ATP where ammunition can be trans-shipped daily from corps vehicles to the using unit transportation. The company provides such field services as MA and salvage collection to the supported brigades and separate battalions or companies. The company also maintains the divisional reserve of Classes I, II, IV, and VII.

(3) *Transportation motor transport company.* The transportation motor transport company provides truck transportation for unit distribution of Class I, II, III (packaged), IV, and VII supplies. It transports the division reserve. It also furnishes vehicles to assist divisional elements with a requirement for supplemental transportation, to include emergency unit distribution of Class V supplies. The company provides heavy equipment transportation for movement or evacuation operations.

(4) *Light maintenance company.* The light maintenance company plans and directs DS maintenance operations of divisional equipment for which the MSB is responsible. It maintains the divisional Class IX ASL. It also operates the reparable exchange service for selected repair parts and maintains the divisional operational readiness floats.

(5) *Heavy maintenance company.* The heavy maintenance company provides on-site and combat system-oriented maintenance support through maintenance support teams. DS maintenance support for-

- Automotive equipment.
- Artillery equipment.
- Tank turrets.
- Fire control systems.
- Engineer equipment.
- Small arms.

(6) *Missile support company.* The company stocks Class IX repair parts for the missile systems listed below. It also repairs and exchanges selected items for these systems. The company does not maintain aircraft missile or armament subsystems. The armament platoon at the AMC provides missile maintenance support for aircraft. The missile support company provides DS maintenance support for-

- Dragon.
- Vulcan.
- Chaparral.
- Ground TOW.
- Forward area alerting radar systems.
- Portable common thermal night sights.

(7) *Medical company.* The medical company operates the division clearing station. It provides unit (Level I) and divisional (Level II) health service support to units in the DSA. It consists of a company headquarters, an ambulance platoon, and a treatment platoon. The company has a 40-patient holding capability. It also has an optical section, a mental health section, and a preventive medicine section.

g. The aircraft maintenance company is either organic to the ASB or a separate company under the DISCOM. It provides AVIM support for the division aviation aircraft, aircraft armament, avionics, and aircraft peculiar items for ground support equipment. It also provides aircraft repair parts, aircraft end item support, and reinforcing aviation unit maintenance.

h. The MSB provides area CSS coverage to the aviation brigade. The aviation brigade also may coordinate with the DISCOM for area support from the FSB when aviation brigade units are in the forward area. When the aviation brigade is task-organized with other combat and CS units and is functioning as a task force (TF) headquarters, the DISCOM may organize the required CSS assets to form a service support element in DS of the

aviation brigade.

i. Support from the DISCOM is coordinated between the aviation brigade and the support operations section of the DISCOM headquarters. Constant communication is maintained with this section so that the aviation brigade's needs are communicated quickly. Much of the support is provided on an area basis. The aviation brigade S4 continuously updates the DISCOM on the status of fuel and ammunition; the DISCOM alerts the appropriate support system. SOPs are established between the aviation brigade and the DISCOM; these SOPs speed resupply of critical items and cover the CSS for the aviation brigade when communications are lost.

j. Heavy divisions are fielding a structure that includes an aviation support battalion (DASB). Like an FSB, it is totally committed to 100-percent support to the maneuver unit; the aviation brigade. The DASB provides supply and ground maintenance. It also provides aviation intermediate maintenance to the division aviation brigade. It operates near the aviation brigade's base of operations. The DASB increases combat capabilities and allows the aviation brigade to be more responsive to the division and ground brigades. It allows longer time on station for the aviation assets. It also permits the aviation brigade to operate in forward areas; at the same time, it reduces the logistical burden of ground maneuver units. When the division aviation brigade has a DASB in support, the brigade S4 will funnel all logistics requirements to the DASB support operations. FM 63-23 addresses the operation of the DASB.

SECTION III. Supply Operations

Supply is the procurement, distribution, maintenance (while in storage), and salvage of supplies, including determination of type and quantity. Supplies are the commodities required to equip, maintain, and operate a military force.

5-7. CLASSES OF SUPPLY

Aviation brigades require and use the established 10 classes of supply. Definitions and examples of each class of supply are discussed below. Miscellaneous supplies include water, maps, captured enemy materiel, and salvage materiel. Supplies are further divided into subclasses. These subclasses denote requirements, such as aviation parts-designated as Class IX(A)-used by system-specific assets.

a. *Class I*-Subsistence items and gratuitous health and welfare items (B-rations, meals ready to eat (MREs), and fresh fruits and vegetables).

b. *Class II*-Equipment, other than principal items, prescribed in authorization and allowance tables (individual equipment, clothing, tentage, tool sets, and administrative supplies).

c. *Class III*-Petroleum, oils, and lubricants (POL), further defined as packaged and bulk POL. Class III (packaged) includes hydraulic and insulating oils, chemical products,

antifreeze compounds, and compressed gases. Class III (bulk) includes multi-fuels and gasoline.

d. *Class IV*-Construction and barrier materials (lumber, sandbags, and barbed wire).

e. *Class V*-Ammunition such as small arms, artillery projectiles, antitank missiles, explosives, mines, bombs, and special ammunition including chemical and nuclear munitions.

f. *Class VI*-Personal-demand items normally purchased through the exchange system such as candy and cigarettes. Class VI normally is requisitioned and distributed with Class I supplies.

g. *Class VII*-Major end items (vehicles, self-propelled artillery pieces, missile launchers, aircraft, and major weapon systems).

h. *Class VIII*-Medical material (medicine, stretchers, surgical instruments, and medical equipment repair parts).

i. *Class IX*-Repair parts and components, including kits and assemblies, and items required for support of all equipment (batteries, spark plugs, and fuel lines).

j. *Class X*-Materiel required to support civil affairs operations such as a commercial-design tractor for use by local civilians.

5-8. CATEGORIES OF SUPPLY

Supplies are requested and issued using three categories of supply: ***scheduled, demanded***, and ***regulated***.

a. *Scheduled.* Scheduled supplies may be reasonably predicted. Requisitions usually are not required for replenishment. Requirements are based mainly on troop strength, equipment density, forecasts, or daily usage or a combination of these factors. Scheduled supplies normally are shipped to users based on preplanned distribution schemes. Classes I, III (bulk), V, and VI are typically scheduled supplies. Classes I and VI are based on troop strength; Class III (bulk) is based on long-range forecasts, equipment densities, and historic usage factors; and Class V is based on densities of weapons and the mission.

b. *Demanded.* A requisition must be submitted for demanded supplies. Items in Classes II, III (packaged), IV, VII, and IX are considered demanded supplies.

c. *Regulated.* Regulated supplies may be scheduled or demanded. However, the commander and his staff must closely control these supplies because of scarcity, high cost, or mission needs. Any item or group of items may be designated as regulated; normally some items in Classes II, III (bulk), IV, V, and VII are regulated. If an item is regulated, the commander who so designated it, must approve its release before it is issued. Items designated as command-regulated are identified in operation plans and orders.

5-9. METHODS OF DISTRIBUTION

Supplying units distribute supplies to using units by two methods: *supply point distribution* and

unit distribution. Aviation brigades use both methods.

a. *Supply Point Distribution.* In supply point distribution, the supplying unit issues supplies from a supply point to a receiving unit. The receiving unit must go to the supply point and use its own transportation in moving the supplies to its area.

b. *Unit Distribution.* In unit distribution, the supplying unit issues supplies and delivers them to the receiving unit's area in transportation assets that the supplying unit has arranged. Throughput is a form of unit distribution in which shipments bypass intermediate supply points or installations. Throughput eliminates the need for double handling. Thus, throughput reduces exposure to pilferage and damage. It results in more efficient use of transportation assets; it is also more responsive to the needs of users. Aviation brigades and subordinate units often employ the unit distribution method of supply.

5-10. REQUISITION AND DISTRIBUTION OF SUPPLIES

a. *Class I (and Class VI when applicable).*

(1) The class I supply system is similar to the system used to distribute other classes of supplies. During the initial phase of the conflict, the system pushes rations. Personnel strength, unit location, type of operations, and feeding capabilities determine the quantities and type of rations ordered and pushed forward. As the battlefield stabilizes, the supply system converts to a pull system. Rations are throughput as far forward as possible.

(2) Class I ration requests are consolidated by subordinate battalions and separate companies. They are forwarded through the aviation brigade or the appropriate support area, if operating independently, to the appropriate MMC. These requests are based on personnel strength.

(3) The supporting Class I distribution point forwards requests to the MMC. The MMC has the rations shipped to distribution points; there the units can pick up the rations via supply point distribution. Normally, a water point is collocated with the Class I point. Rations are segregated in unit lots or item piles; or the truck-to-truck method may be used. Extra rations are usually not available at distribution points. Therefore, ration requests must accurately reflect personnel present for duty, to include any attached personnel.

(4) The brigade S4 generates ration replenishment requests for basic loads. He also monitors the operational ration requests. Figure 5-1 illustrates the requisition and distribution of Class I supplies.

b. *Classes II, III (packaged), IV, and VII.*

(1) Units normally requisition these items. The requisitions originate at the battalion. They are consolidated at the brigade unless the battalion is operating under another headquarters. The requests are then compiled at the next support echelon such as a CSG, an MSB, or an FSB. These requests are then forwarded to the applicable MMC. Normally, the items are authorized for shipment to the supply point in the support area via unit distribution. The items are then distributed to the battalion using

supply point distribution. In some cases, the items may be distributed by throughput distribution from the theater, corps, or division to subordinate battalions.

(2) The greatest activity for requesting and distributing these items occurs before combat operations begin. Many of these items are "command-controlled" because of their criticality. Figure 5-1 also shows the typical flow of Classes II, III (packaged), IV, and VII.

(3) A special management system-weapon system replacement operations-replaces critical pieces of equipment for Class VII major weapon systems. The weapon system, to include personnel and ancillary equipment as well as the major end item, is selectively replaced consistent with available resources and priorities. Associated with weapon system replacement operations are the ready-for-issue weapon system, the linkup, and the ready-to-fight weapon system. A ready-for-issue weapon system has been removed from preservation. All ancillary equipment-such as fire control, machineguns, radio mounts, and radios-has been installed. The vehicle has been fully fueled and ammunition has been stored. Basic issue items are packed in boxes. The linkup joins a ready-for-issue weapon system with a trained crew that results in a ready-to-fight weapon system. The ready-to-fight weapon system is a completely processed weapon system with crew. The receiving unit is then responsible for local SOP mission training.

(4) The battalion or TF executive officer is the weapon system manager for the battalion; he coordinates the efforts of the S1, the S4, and other CSS assets. The XO allocates weapon system resources to companies that are supervised by the battalion S1 and S4 and their counterparts at the next higher level of command. A situation report is kept current by spot reports. The SITREP provides information to the commander and staff on the status of weapon systems within the companies. When losses occur, the appropriate requisition is placed into the system.

(5) The aviation brigade XO normally is the weapon system manager for the brigade. The brigade is a tactical headquarters that influences combat power largely through task organization. It is not just an administrative headquarters. The weapon system manager at the brigade level monitors weapon systems; however, he does not directly allocate them to the battalions.
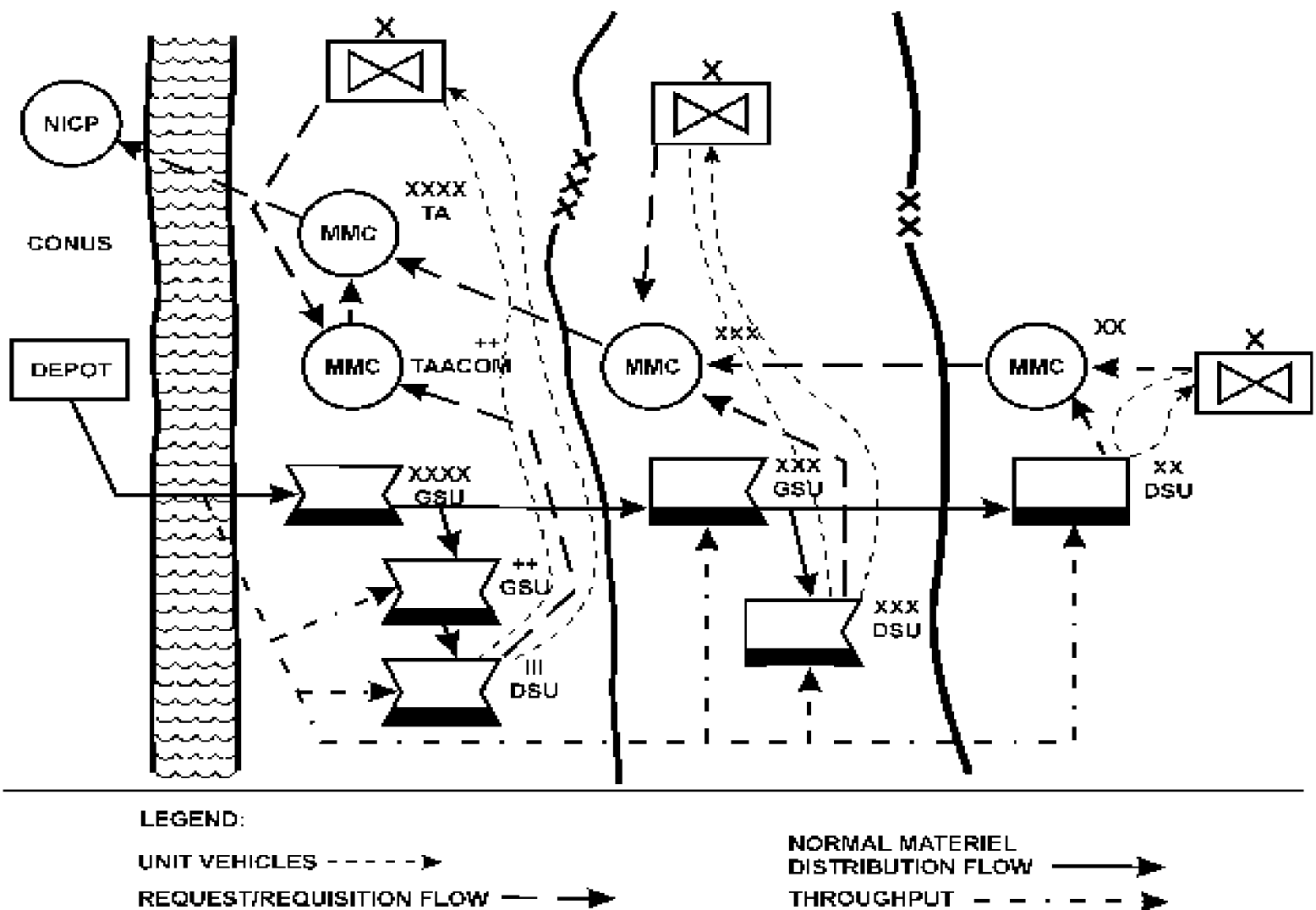
Figure 5-1. Requisition and distribution of Class I, Class II, Class III (P), IV, and VII supplies

c. *Class III (bulk).*

(1) Units normally use fuel forecasts to requisition bulk POL. Units submit requisitions to higher headquarters to cover estimated fuel usage for a specified period. Companies and battalions estimate the amount of fuel they will require based on projected operations, usually for the period covering 72 hours beyond the next day. The battalion S4 consolidates these estimates. He then forwards them through the brigade S4 or supporting unit to the appropriate materiel management center (MMC); the MMC coordinates to have the fuel available in or near the support area when it is needed by the units. Annex J has further information on this subject and FARP operations.

(2) Bulk POL is delivered to the support area Class III supply point by unit distribution. The battalion fuel trucks may be issued the fuel at this supply point. Then they return to the battalion area either as a part of logistics packages or to refueling points in battalion FARPs.

(3) The basic load of Class III (bulk) for the battalion is the hauling capacity of the unit's fuel vehicles and the capacity of the fuel tanks on all the battalion's vehicles. Topping off vehicles when possible, regardless of the fuel level of the vehicle, is essential to continuous operations.

(4) A key exception to this principle is refuel-on-the move operations. Though these operations may use unit assets, typically they involve use of equipment of supporting fuel units. The purpose is to ensure a unit's vehicles and bulk fuel assets are topped before an operation. Details are in FM 10-71.

(5) Class III (B) for the division and corps aviation brigade is delivered by corps assets. The division can store a 1-day supply of Class III (B) with division assets. This fuel is stored and distributed from collapsible bladders or a 5,000-gallon tanker trailer. Class III (B) normally is delivered to the MSB and routinely delivered by corps as far forward as the BSA for the aviation brigade as a wholesale customer. However, it may be delivered as far forward as combat trains (FARP) in specific situations. Figure 5-2 illustrates Class III (bulk) supply operations for aviation brigades.
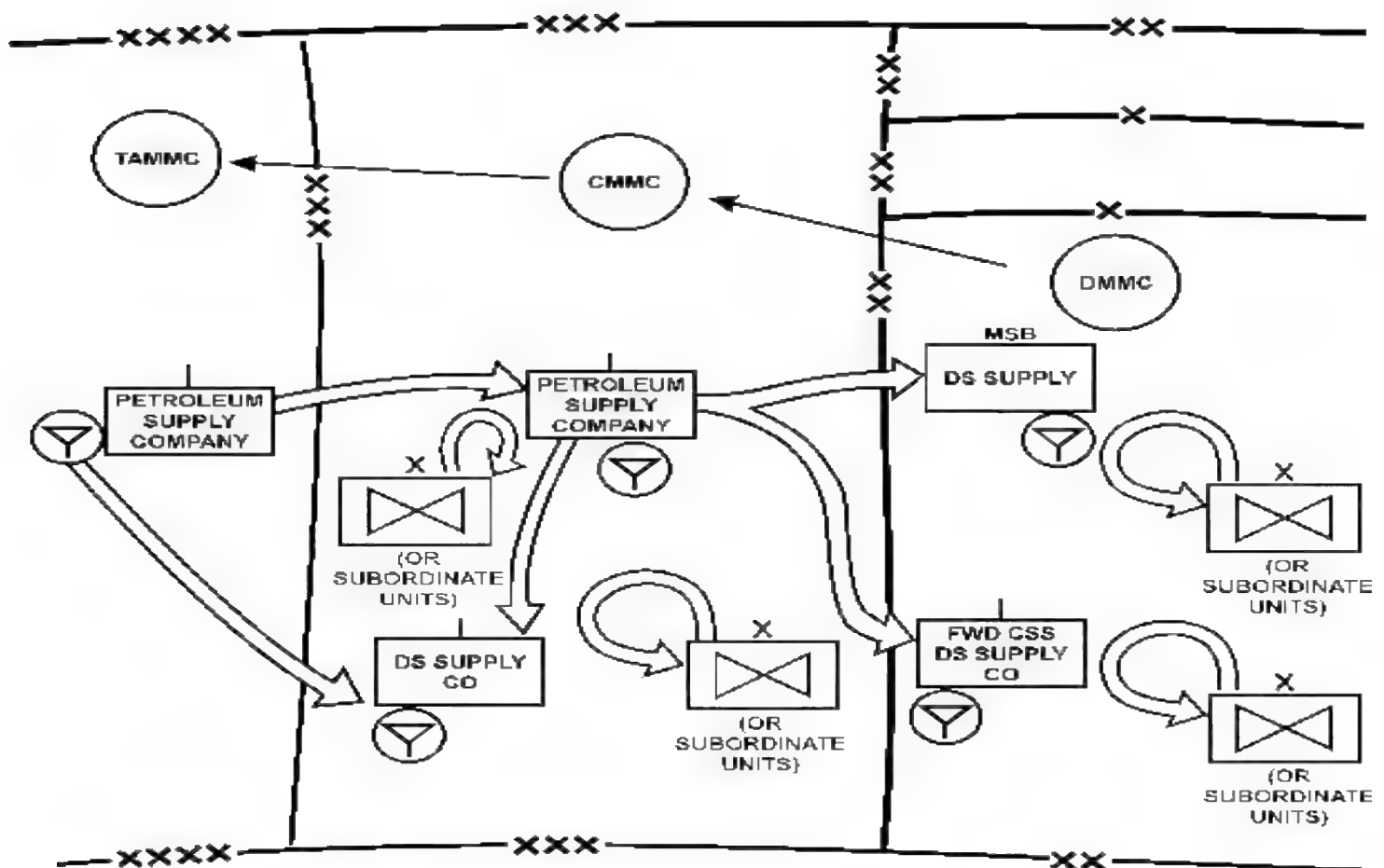
Figure 5-2. Class III (bulk) supply operations for aviation brigades

d. *Class V and Class V(A) (conventional ammunition).*

(1) Effective and efficient ammunition support requires integrated information and distribution management at all levels from the combat user to the CONUS sustaining base. Ammunition managers use combat loads rather than the previously used days of supply. Combat loads measure the amount of Class V a unit can carry into combat on its weapons system.

(2) Conventional ammunition-Class V and Class V(A)-is the standard ammunition associated with conventional weapons such as M60 machineguns for the UH-60 Black Hawk and weapon systems mounted on the AH-64 Apache. These classes include standard explosives such as hand grenades, claymores, and C-4 and pyrotechnics (flares, star clusters, and smoke grenades). Special ammunition includes nuclear ammunition and special missile warheads and rocket motors such as Lance missiles.

(3) The required supply rate (RSR) is the estimated amount of ammunition needed to sustain the operations of a combat force without restrictions for a specific period. RSR is expressed in rounds per weapon per day. This RSR is used to state ammunition requirements. The S3 normally formulates the RSR.

(4) The controlled supply rate (CSR) is the rate of ammunition consumption that can be supported for a given period. The CSR is based on availability, facilities, and transportation. It is expressed in rounds per unit, individual, or weapon system per day. CSRs are established by the commander for his subordinate units. A unit may not exceed its CSR for ammunition without authority from higher headquarters. The S4 matches the CSR against the RSR; he then remedies shortages by requesting more ammunition, suballocating ammunition, or prioritizing support to subordinate units.

(5) The basic load is the quantity of ammunition authorized by the theater commander for wartime purposes and required to be designated for and carried into combat by a unit. The basic load provides the unit with enough ammunition to sustain itself in combat until the unit can be resupplied.

(6) Ammunition is normally requested by the battalion S4 on a DA Form 581 (Request for Issue or Turn-in of Ammunition); this form is forwarded to the appropriate MMC or designated ATP representatives. Once the request has been authenticated, the ammunition is issued by supply point distribution to the battalion or brigade Class III/V platoon trucks either at the ATP or at the corps ASP consistent with the CSR in effect.

(7) At the division, all FSBs can run one ATP. These ATPs are located in the BSA and contain high-tonnage, high-usage ammunition to support all the division units operating in the brigade area. The ammunition is brought to the ATP by throughput distribution from the corps on stake-and-platform trailers. The ammunition is then transferred to the battalion trucks or off-loaded for future transfer. All other ammunition is found in the ASP in the corps support area; this area is normally

located directly behind the rear of the division area. In the heavy division, small arms ammunition normally is found in the ASP; tank and TOW missile ammunition is found in the ATPs. Figure 5-3 shows the flow of Class V for aviation brigades.

(8) For maintenance and accountability, the theater normally stocks chemical ammunition. Chemical ammunition is deployed based on national policy and theater directives. When deployed, chemical ammunition will normally be issued at a chemical ASP that is collocated with the conventional ASP.

(9) FM 9-6 details the doctrinal layout of a mature ammunition system in a developed theater.

e. *Class V and Class V(A) (special ammunition).* Nuclear ammunition requires special authorization and handling. Nuclear ASPs are set up by theater and corps special ammunition units to store and distribute nuclear ammunition. A firing unit is given a prescribed nuclear load (PNL). This load tells the unit the amount of nuclear ammunition that the unit is authorized to carry. These allocations allow the commanders to plan the number and type of strikes they will be authorized for a given time. The establishment of these PNLs and allocations do not constitute authority to fire the ammunition. These allocations also do not mean that the commander has physical custody or possession of the ammunition. It takes a command directive to stock or replenish PNLs. All special ammunition is controlled by the NCA through the Joint Chiefs of Staff. Stringent physical security and technical maintenance requirements apply to all nuclear ammunition.
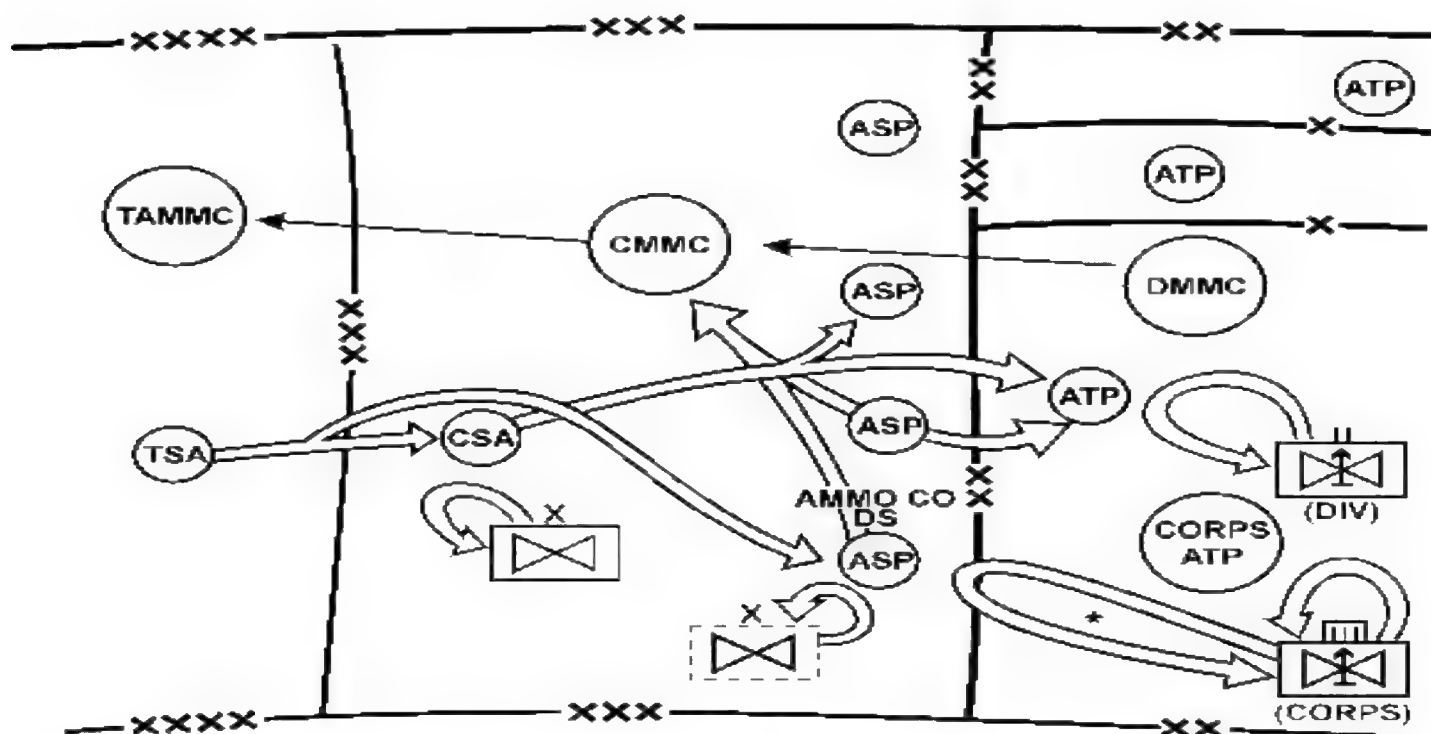
LEGEND:
———► REQUEST/REQUISITION   ══════▷ SUPPLY
★ CHANGING DOCTRINE MAY REDUCE THIS LOOP. A CORPS ATP MAY BE EMPLOYED IN THE DSA TO SUPPORT CORPS UNITS IN THE DIVISION SECTOR.

Figure 5-3. The flow of Class V supplies for aviation brigades

f. *Class VI.* Class VI supplies are Army and Air Force Exchange Service (AAFES) items for sale to troops and authorized individuals. Class VI supplies may be available through local procurement, transfer from theater stocks, or requisitioning from AAFES in CONUS. Available shipping space dictates Class VI supply to the theater. Class VI supply responsibilities differ significantly from other classes of supply. Health and comfort items (formally referred to as ration supplement sundry packages) are class VI supply items managed by the Defense Personnel Supply Center. They have a national stock number and are issued through the standard supply system (normally class I supply channels) without cost to soldiers in the early stages of a deployment. They contain items such as disposable razors, toothbrushes, toothpaste, and other personal care items. AR 30-7 and DLA Regulation 4145.36 have additional information on these packages.

g. *Class VII.* Class VII supplies consist of major end items such as launchers, tanks, vehicles, and aircraft. A major end item is a final combination of end products which is ready to use. Because of their importance to combat readiness and their high costs, class VII items usually are controlled through command channels. If not, the supporting MMC controls them. Each echelon intensely manages the requisitioning, distribution, maintenance, and disposal of these items to ensure visibility and operational readiness. Units will report losses of major items through both supply and command channels. Replacement of losses requires careful coordination and management. As discussed earlier, weapon system managers at each command level work to maximize the number of operational weapon systems. Replacement requires coordination among materiel managers, Class VII supply units, transporters, maintenance elements, and personnel managers.

h. *Class IX and Class IX(A).*

(1) The MMC normally manages Class IX. The maintenance units at the various levels of command no Within the subordinate aviation battalions, the AMC (AVUM) maintains prescribed load lists (PLLs) of repair parts; these lists are based mainly on demand-supported stockage criteria. These PLLs allow the units to have on hand high-usage, high-demand items; thus, quick repairs can be made. An authorized stockage list of repair parts is main tained at the DS or AVIM level. The ASL is a list of all items authorized to be stocked at a specific level of supply. This ASL becomes the supply point from which the units can maintain their stockage of PLL items at authorized levels. These supply units also provide a direct exchange service for repairable components. The MMC calculates stockage levels for the ASL.

(2) Class IX requisition begins with the unit's filling requisitions from its PLL. If the item is not stocked on the PLL or is at zero balance, the requisition is passed to the supply unit. This unit will fill the request from the ASL stocks or pass the requisition to the MMC. The ASL Class IX for ground equipment is normally maintained by the light maintenance company of the maintenance support battalion. The AMC maintains the Class IX(A) ASL for aviation repair parts. Figure 5-4 shows the requisition and

distribution for Classes IX and IX(A).
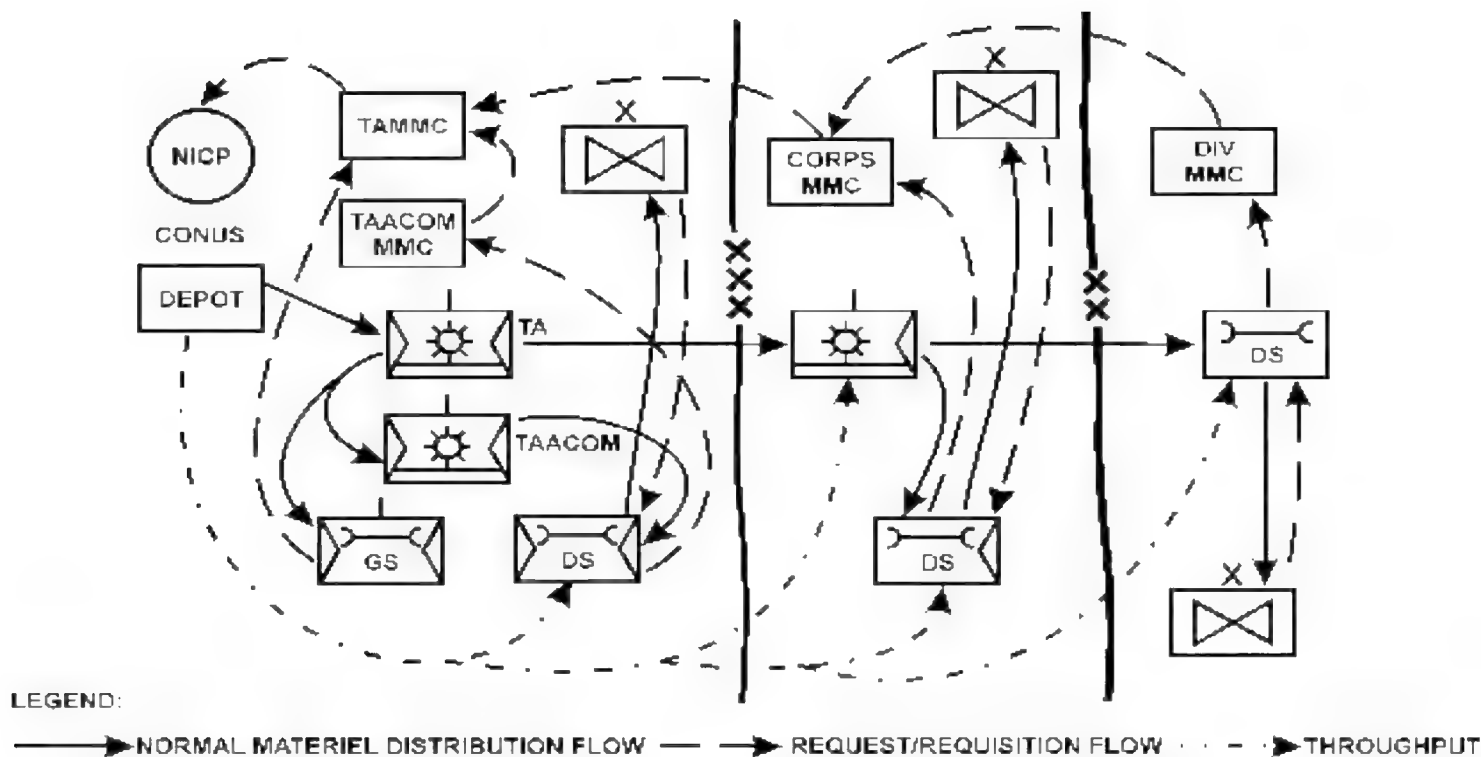
Figure 5-4. The requisition and distribution for Classes IX and IX (A)

(3) The unit PLLs are highly mobile and travel with the units. Some ASL stockage of high-turnover repair parts may accompany forward support elements in the support area.

5-11. SUPPORT BY HOST NATION

Logistics and transportation may be provided by host nation organizations and facilities. Common classes of supply may be available and obtained from local civilians. Items may include barrier and construction materials, fuel for vehicles, and some food and medical supplies. Requisition and distribution are coordinated through logistics and liaison channels.

SECTION IV. Maintenance Operations

Tactical success on today's battle field demands that equipment be maintained, recovered, repaired, or replaced as quickly as possible. Good maintenance practices, forward positioning of maintenance units, effective repair parts and equipment replacement systems, and clear priorities for recovery and repair are vital.

5-12. MAINTENANCE PRINCIPLES

a. Maintenance is a combat multiplier. When opposing forces have relative parity in numbers and quality of equipment, the force that combines skillful use of equipment with an effective maintenance system has a decided advantage. It has an initial advantage in that it enters battle with equipment that is operational and likely to remain so longer. It has a subsequent advantage in that it can return damaged and disabled equipment to the battle faster. Gaining these advantages is the real purpose of a maintenance system.

b. Forward maintenance elements are critical to the tactical operational success of the maintenance concept; elements at all levels must work together in concert to ensure the attainment of the unit goals and objectives. They must have the proper personnel, equipment, tools, and replacement parts. Personnel must be well trained in the theory and principles of systems and capable of diagnosing and correcting faults. In addition, they must have immediate access to high usage parts. Readiness level maintenance units must concentrate on the rapid turn around of equipment to the battle, while sustainment level maintenance units repair and return equipment to the supply system. METT-T and command policy restrict the type or level of repairs each unit performs; units should not strictly adhere to arbitrary repair time intervals.

c. Traditionally and correctly, fixing is viewed primarily as a CSS function; it is central to tactical and operational success. A viable maintenance system is agile and synchronized to the combat scheme of fire and maneuver. It anticipates force requirements. A commander who has 70 percent of his aircraft operational may wisely delay an attack if he can realistically expect the fixing process to have 90 percent ready within 24 hours. As an alternative, he can weight the battle by allocating replacement systems as discussed earlier.

5-13. VEHICLE AND EQUIPMENT MAINTENANCE AND RECOVERY

The maintenance system is organized around forward support. All damaged or malfunctioning equipment should be repaired on-site or close to the site. Thus, timely repairs can be made, which keeps most equipment operationally ready. Maintenance normally is performed at four levels-unit, DS, GS, and depot. The principles used to implement this concept are discussed in the following paragraphs.

a. *Flexible Unit Structure.* In a flexible unit structure, maintenance forces are tailored to the weapon systems they are supporting. For example, maintenance support teams-formed from DS maintenance units-are weapon- system specific; these teams are placed forward to support the brigade. Another example is the formation of BDA teams within company and battalion trains for quick, accurate assessments. These teams expedite rapid vehicle recovery or evacuation to the level of support needed to correct the problem. Individual operators and users of assigned equipment perform unit maintenance. Each piece of equipment requires preventive maintenance checks and services. This maintenance category also requires scheduled and unscheduled inspections and replacement of some components. Unit maintenance maximizes the operational readiness of equipment by preventive maintenance and early diagnosis of problems. This level of maintenance is found in companies and battalions.

b. *Direct Support.* In DS, maintenance units are organized to repair weapon systems

quickly. These repairs enable systems to be operationally ready. DS maintenance units offer one-stop maintenance service to the supported units. They provide extensive maintenance expertise and capabilities and repair parts supply support to units in the brigade. DS maintenance units are tailored to weapon systems within the brigade. They have extensive component repair capabilities. This level of maintenance is normally found in the maintenance company of the ASB, FSB, and MSB of the DISCOM and in corps and COSCOM maintenance units.

c. *General Support.* In GS, maintenance units repair items in support of the supply system. GS maintenance is characterized by extensive component repair capability. It supports the supply system within the theater by repairing damaged systems for issue through the supply system as Class II, VII, or IX items. This level of maintenance normally is found in corps and US Army Aviation and Missile Command (AMCOM) assets. In wartime, GS maintenance may be selectively curtailed to free personnel for DS work.

d. *Depot Maintenance.* Overhaul and rebuilding operations characterize depot-level maintenance. This category of maintenance is normally associated with US Army Materiel Command activities. This command supports the overall DA inventory management program. These activities are normally confined to CONUS-based depots; however, limited depot maintenance is found in AMCOM.

5-14. VEHICLE AND EQUIPMENT RECOVERY PROCEDURES

FM 20-22 describes technical aspects of recovery. The recovery manager coordinates recovery operations with the overall repair effort to best support the commander's priorities and the tactical situation. The goal is timely return of equipment to operation with the least expenditure of resources.

a. *Recovery Principles.* The general principles below apply to recovery operations.

(1) The preferred method of recovery is for the unit to recover its own equipment. The unit is responsible for recovering its own disabled equipment with wreckers, tow bars, and recovery teams. When it lacks the physical means to recover an item, the unit requests assistance from the supporting maintenance element.

(2) Management of recovery operations is centralized at the battalion whenever possible. This centralization does not preclude delegating recovery authority for specific operations to company maintenance teams.

(3) The commander organizes the recovery resources to best support the unit mission. Changes in the type and quantity of supported equipment, as well as the tactical situation, may require reorganization of recovery assets.

(4) Recovery operations are coordinated with the maintenance effort. Maintenance personnel repair equipment as far forward as possible within the limits of the tactical situation, amount of damage, and available resources. Repair or recovery decisions are based on maintenance time guidelines. The estimated repair time helps determine the maintenance activity to which the item should be recovered.

(5) A 24-hour capability is required. Operations require continuous, responsive

recovery support. Roadside recovery operations on an area basis may be rotated among maintenance units to provide recovery support beyond the capability of using units.

(6) The proper recovery equipment is used for the recovery mission. Wreckers normally recover wheeled vehicles; tracked recovery vehicles recover track equipment. However, the best available recovery vehicle is used to support an increasing workload with a limited number of recovery assets. For example, if a lighter recovery vehicle is not available, a heavier vehicle, such as a medium recovery vehicle (M88), may have to recover an armored personnel carrier.

(7) Recovery vehicles return equipment no farther to the rear than necessary, usually to the maintenance collection point of the supporting maintenance unit. Thus recovery vehicles are kept available in the forward areas. DS units use heavy equipment transporters to evacuate heavy items received from using units.

(8) Accurate location information is provided to the recovery manager and crews. Ground guides may be required when specific location information is not available or where the tactical situation is not well defined.

(9) Route selection for the towing of multiple vehicles is important. Safe operation requires that the combined load not exceed the recovery vehicle's braking ability on a steep grade.

(10) Recovery missions that might interfere with combat operations or compromise security are coordinated with the tactical commander concerned. When recovery assets are limited, the commander sets the priority based on his need for the item and the tactical situation. The type of disability also affects the priority when two or more like items must be recovered. In general, combat vehicles are recovered first.

b. *Priority Sequence*. The following sequence usually provides the maximum return for recovery effort expended:

- Classified items.
- Terrain-stuck items.
- Items with failed or damaged components needing little repair.
- Items requiring long recovery and repair times before they are returned to service.
- Contaminated items.
- Uneconomically repairable items.
- Enemy materiel.

c. *Alternatives.* Local options are considered and tried before a recovery mission is attempted. Field-expedient repair and self- or like-vehicle recovery may do the job without a recovery vehicle.

d. *Recovery Support.* Recovery support is provided on a unit or an area basis. Using units normally provide support on a unit basis. Maintenance units may have an area support mission for using unit backup support for out-of-sector units operating in the area.

e. *Recovery Initiation.* Equipment recovery begins where the item became disabled.

(1) When the equipment operator or crewmember detects an inoperable condition, he assesses the damage. He then acts based on his analysis and the tactical situation.

(2) The equipment operator or crewmember informs the chain of command. The unit SOP prescribes notification procedures; these vary based on the type of unit, equipment, communications available, tactical situation, and location of equipment. Combat vehicles usually have radio communications. Other means may have to be used for reporting on disabled tactical and administrative equipment. Lack of communication for out-of-sector equipment requires the operator or crew member to act independently; he may have to coordinate directly with other units in the area or with the supporting maintenance unit for repair or recovery support.

f. *Ground Support Equipment Maintenance.*

(1) Commanders are aware of the readiness status of their GSE at all times. This equipment assists maintenance personnel in performing their maintenance tasks. A poor state of maintenance may be due to repair and operation of the equipment by untrained personnel. Commanders and maintenance personnel watch for signs of equipment neglect such as-

- Overdue inspection dates.
- Little or no stockage of repair parts.
- Missing maintenance records.
- Storage of end items for long periods.
- Leaks and missing parts.
- Improperly marked or painted equipment.
- Dirty equipment.
- Missing BII.
- Malfunctioning equipment.

(2) Though not all-inclusive, these indicators provide the commander and maintenance personnel with a general idea of the status of the GSE of the unit. Equipment often continues in a nonmission-capable status because parts are difficult to obtain. Supervisory personnel ensure that this shortage does not result from poor supply requisitioning procedures and uncontrolled cannibalization. All personnel should be aware of the importance of GSE to the overall mission. They must ensure that GSE is properly operated and maintained.

(3) The light maintenance company of the MSB provides DS for GSE in the aviation brigade.

(4) The maintenance company of the DASB provides DS for GSE in the aviation brigade of the heavy divisions.

5-15. AVIATION MAINTENANCE

On the modern battlefield, aviation maintenance is performed on a 24-hour-a-day basis. The governing concept is to "replace forward, repair rear" so that aviation units can rapidly return aircraft to meet immediate battle needs. Damaged or inoperable aircraft that require time-consuming repair actions are handled in more secure areas toward the rear. Aviation maintenance is divided into two categories-scheduled and unscheduled.

a. ***Scheduled Maintenance.*** Scheduled maintenance includes predetermined cyclic inspections of aircraft systems and replacement of components. These recurring events are scheduled either on a calendar or flying-hour basis. The frequency of inspections or replacements is listed in each aircraft technical manual. The intervals stated in these manuals are maximum intervals that will not be exceeded except during critical combat operations when authorized by the unit commander. All-inclusive airframe and subsystem inspections are performed (in different depth) at daily and phased intervals. The exact calendar or flying-hour scheduled maintenance intervals may differ by type of aircraft. During critical battlefield situations, the potential of grounding aircraft or overflying scheduled maintenance events should be avoided. All imminent scheduled maintenance should be accomplished before deployment or entry into surge operations. This consideration includes aircraft being initially deployed to the battlefield or those already there that are being prepared for surge operations. The guidelines, standards, and limitations for early action are included in SOPs governing specific operations. The following options should be considered when scheduled maintenance is delayed:

(1) Evaluate resources available (people, parts, tools, and time) and adjust them accordingly.

(2) Seek help. The supporting AVIM company can augment unit maintenance personnel during surge activities. AVIM repairers can perform inspections and repair and replacement operations at the AVUM location.

(3) Reduce nonproductive time. Exempt necessary maintenance personnel from other duties. Reduce maintenance distractors such as equipment shortages or insufficient parts and publications.

(4) Reverse the work schedule to perform night maintenance. Establish split shift maintenance operations.

(5) Reduce the mission load. Slow daily missions to allow time for collective/corrective maintenance.

(6) Defer maintenance according to TM 1-1500-328-23.

b. ***Unscheduled Maintenance.*** Unscheduled maintenance is maintenance that is generated by premature or unexpected aircraft system or component malfunction or failure or that is required to correct damage incurred from improper operation or battlefield activity. Because it is not predictable, units must be doctrinally and organizationally prepared to apply responsive corrective action on an as-needed basis. The aircraft combat maintenance and battlefield damage repair concept, discussed in paragraph 5-14, applies to such occasions. FM 1-500 covers Army aviation maintenance in more detail.

5-16. SUPPORT SYSTEM STRUCTURE

The support system is composed of a three-level structure: aviation unit maintenance, aviation intermediate maintenance, and depot maintenance. AVUM and AVIM organizations are found on the battlefield; they are addressed in the maintenance allocation charts. Specific organizational structures vary somewhat, depending on whether they are in a division (light or heavy) or corps. The basic concepts of aircraft maintenance are discussed below. These include tasks and procedures within AVUM and AVIM organizations and AVUM-AVIM unit coordination. The repair manual for each aircraft contains allocation charts that give specific tasks assigned to each level.

5-17. AVIATION UNIT MAINTENANCE

a. All operational aviation units are responsible for AVUM. Unit maintenance operations should ensure that the maximum number of reliable, fully mission-capable aircraft are available to the battlefield commander. The general concept is for crewchiefs assigned to specific aircraft to perform daily servicing, daily inspections, limited troubleshooting, and high-frequency, remove-and-replace aircraft repairs. Normally, an AVUM element within the organization performs scheduled maintenance (other than daily inspections) and the more time-consuming operator-level repairs. In the attack battalion, for example, attack company personnel perform crewchief maintenance. AVUM assets within the battalion, normally the Delta company, accomplish the scheduled and unscheduled maintenance and longer-duration repairs. Specific structures differ among different organizations, including battalions and companies within the same division.

b. During operations, most AVUM platoons or companies are located in the forward portion of the support area. However, depending on the situation, elements of the AVIM may be found in the appropriate support area, battalion trains, or battalion FARP. The AVUM maintains aircraft brought to rear areas; it also sends teams forward to assist with on-site aircraft combat maintenance and battle damage repairs and to recover downed aircraft.

c. In some situations, normal maintenance procedures must be expedited to meet battle objectives. In such cases, the unit commander authorizes the use of aircraft combat maintenance and battle damage repair procedures. Aircraft combat maintenance and battle damage repair is an AVUM responsibility with backup from supporting AVIM units. The concept uses specialized assessment criteria, repair kits, and trained personnel. Thus, damaged aircraft can be returned to the battle as soon as possible. Often, such "return to battle" repairs are only temporary. Permanent repairs may be required when the tactical situation permits. The aircraft combat maintenance and battle damage repair system multiplies force capability in a combat environment by augmenting the existing peacetime maintenance system.

d. The aircraft combat maintenance and battle damage repair team is formed from AVUM platoon assets. A typical team has a trained inspector (MOS 67) for damage assessment, two or three repairers (MOS 67/68), and a maintenance test pilot (MTP). The makeup of a team for a specific mission depends on the maintenance work anticipated.

e. The team uses aircraft combat maintenance and battle damage repair manuals. These manuals contain revised aircraft damage assessment criteria and repair procedures. The manuals are formally processed, validated publications for use only in combat

environments and as authorized by the unit commander. They are prepared for each type of aircraft and contain combat damage inspection and assessment techniques. They provide combat area maintenance serviceability and defer criteria and expedient repair procedures for quick-fix or temporary repairs. They also contain cannibalization techniques for quick removal of critical components and structures from nonrepairable and nonrecoverable aircraft.

f. The aircraft combat maintenance and battle damage repair team will use specially designed combat repair kits for repairing major aircraft systems. These suitcase-size toolkits can be carried by one person. The tools and materials will permit the team to make quick and temporary combat damage repairs.

g. An aircraft may be forced down on the battlefield. In this case, the aircraft combat maintenance and battle damage repair procedures below apply as time and security allow.

(1) The aircraft commander, or one of his crew, uses the aircraft radio, if it is operable and the tactical situation permits, to notify the parent AVUM commander of the problem. He requests aircraft combat maintenance and battle damage repair assistance. This information may have to be relayed through other aircraft operating in the area. The information includes-

(a) The location of the down site, an assessment of security, and the adaptability of the site-to include existing weather conditions-for inserting an aircraft combat maintenance and battle damage repair team.

(b) The existence or evidence of chemical contamination.

(c) The enemy situation to include the ADA threat.

(d) An evaluation of aircraft damage so that aircraft combat maintenance and battle damage repair personnel, equipment, and parts requirements can be estimated.

(e) The condition of the crew and passengers and their ability to continue the mission or assist in repair ing the damage. For example, the aircraft commander may be able to fly the aircraft out; therefore, an aviator would not be needed on the aircraft combat maintenance and battle damage repair team.

(f) The accessibility to the downed aircraft.

(2) The AVUM unit commander authorizes the dispatch, of an aircraft combat maintenance and battle damage repair team to the site. The team will carry manuals, repair kits, materials, and repair parts.

(3) The initial on-site inspection by the team will determine the extent of damage. It also will provide the information necessary for a decision on whether to-

(a) Clear the aircraft for immediate return to battle, deferring any damage repairs to a later time.

(b) Apply permanent repairs, returning the aircraft to a completely serviceable

condition.

(c) Apply temporary repairs that will safely allow return of the aircraft to meet immediate battle needs, deferring higher standard permanent repairs to a later time.

(d) Repair the aircraft to allow a one-time flight back to a more secure and better equipped maintenance area.

(e) Rig for aerial or ground recovery and make the necessary recovery arrangement.

(f) Cannibalize critical components and abandon or destroy the aircraft, if directed.

(4) One of the assessor's primary tasks is to determine the location of the damaged aircraft in relation to the battlefield and the extent of the threat. AD threats may make aerial recovery in forward areas of the battlefield impractical or of an unacceptably high risk. The assessor must be able to rapidly determine whether a one-time flight is feasible or if a quick-fix repair is possible. Thus, aircraft may not have to be destroyed (in place) to prevent capture or compromise. Once the battle subsides, maintenance decisions are based on standard operational maintenance practices. Deferring maintenance tasks is a "fly now, pay later" concept. Postponing maintenance increases availability for short periods only.

5-18. AIRCRAFT RECOVERY OPERATIONS

a. *Preparing and Performing Recovery Operations.* Aircraft recovery operations move inoperative aircraft from the battlefield to a maintenance facility. When an aircraft cannot be fixed for self-powered evacuation from the down site, it is prepared for movement directly to the first appropriate maintenance activity, using another aircraft or a surface vehicle. FM 1-513 contains detailed procedures for preparing for and performing recovery operations for specific aircraft.

b. *Efforts Required for Recovery Operations.* The aviation operational unit, using its AVUM assets, is responsible for aircraft recovery. Supporting AVIM units provide backup recovery support when aviation units are overloaded or complex aircraft disassembly is required. When medium helicopter support is required, corps assets normally are requested. Recovery operations require a highly coordinated effort. The effort required includes-among the owning organization-its AVIM support, the ground element in whose area the recovery takes place, and any organization providing aircraft or vehicle assets to complete the recovery. Overall coordination control of the recovery rests with the aviation brigade staff. In most cases, the aviation brigade will have to task subordinate lift elements to provide support or request assistance from the corps CH-47 Chinook battalion.

c. *Aircraft Recovey Team.* Each AVUM organization prepares for aircraft recovery contingencies by designating an aircraft recovery team to be dispatched to downed aircraft sites as the situation requires. This team consists of maintenance personnel, an MTP, and an aircraft inspector, who are trained in preparing aircraft for recovery. The team chief

ensures that appropriate rigging and recovery equipment is identified, available, and prepared for short-notice recovery missions. The size and composition of the team depend on the type and size of the disabled aircraft, type of recovery aircraft or vehicle used, and length of time the recovery area remains accessible. The aircraft combat maintenance and battle damage repair team and the recovery team are sometimes the same.

d. *Surface Recovery*. When a downed aircraft cannot be flown out under its own power, the recovery team determines the best method of recovery and implements that recovery action. The basic decision is whether to use surface or aerial means to recover the aircraft. Surface recovery and evacuation use ground equipment and wheeled vehicles to deliver a disabled aircraft to a maintenance facility. The planning of a surface recovery follows logical steps. First is an evaluation of the aircraft to be recovered, the type of equipment and transportation means required for the recovery, and thorough reconnaissance and evaluation of available ground routes to and from the recovery site. Further considerations include the characteristics of the recovery site and factors concerning the tactical situation. These factors include likely enemy avenues of approach, mine fields, actions to minimize the danger of boobytraps in downed aircraft, tactical cover, and the need for escort troops or aerial security to protect against ambush. Surface recovery, when compared to aerial recovery, has both advantages and disadvantages.

(1) *The advantages are-*

(a) Enemy forces are unable to detect the movement of recovery assets unless enemy forces are relatively near those movement routes.

(b) Recovery equipment malfunction is unlikely to result in total loss of the aircraft during transport.

(2) *The disadvantages are-*

(a) The overall lapsed time for the recovery operation is much greater than that for aerial recovery. For example, recovery personnel and equipment assets are tied up for a long time; the threat is increased because of relatively long exposure time on the battlefield with slow-moving equipment.

(b) Often, a great amount of aircraft disassembly or modification is required to adapt the aircraft to surface travel. For example, shortening of height dimensions may be required to accommodate overhead road clearances.

(c) Ground routes must be accessible.

(d) Reconnaissance of the route must be meticulous.

(e) Surface recovery may tie up route security assets that are greatly needed elsewhere.

(f) Loading procedures and rough terrain travel can further damage the aircraft.

e. *Aerial Recovery.* Aerial recovery is accomplished by preparing the aircraft for movement, attaching suitable airlift recovery equipment and connecting it to the lifting

helicopter, and flying the aircraft to the maintenance area. Planning for aerial recovery entails thorough analysis of the recovery site characteristics and the threat associated with relatively slow air movement over the battlefield. Aerial recovery, when compared to ground recovery, has both advantages and disadvantages.

(1) *Advantages.*

(a) It is much faster, minimizing the time consumed by recovery assets and reducing battlefield exposure time.

(b) Route reconnaissance requirements are considerably less.

(c) Less aircraft disassembly is required.

(d) Recovery site accessibility requirements are not as rigid.

(e) Security escort requirements are usually less.

(2) *Disadvantages.*

(a) Aircraft can be completely lost if recovery equipment fails. For example, the aircraft could be dropped because of faulty slings or improper hookup procedures.

(b) Although exposure time is less, the distances from which recovery is detectable are much greater.

(c) Loss of recovery assets through enemy action will more severely degrade total force fighting capabilities. Degradation occurs because of the versatility and relatively few numbers of utility and cargo helicopters, particularly chinook helicopters, in comparison to ground recovery vehicles.

5-19. AVIATION UNIT MAINTENANCE MOBILITY

a. Frequent and rapid relocation is typical of unit operations on the battlefield. This is particularly true for assault and attack helicopter assets. The AVUM element is normally separated from these companies, reducing the comparative number of moves. However, the AVUM commander still prepares to relocate the unit, or portions of it, often. During surge operations, these moves may be made as often as every 24 hours, based on METT-T. Frequent relocation of the platoons greatly affects maintenance operations. Critical assets-FARPs and aviation maintenance contact teams-move throughout the battlefield similarly. They are organized and equipped to ensure 100 percent transportability and mobility. Thus, maximum support is provided to aviation forces.

b. Mobility-related factors must be taken into account. The major ones are discussed below.

(1) The AVUM normally move at a rapid pace. AVUM and HHC assets are typically located in the brigade rear area and require 100-percent mobilization and 100-percent transportability. The frequency and rapidity of moves again depend on METT-T. An AVUM or a supporting asset may not be able to sustain maintenance

support for aviation operations if it moves every 24 hours.

(2) Maintenance capabilities are greatly reduced during moves. At least a 4-hour loss of productive maintenance time can be anticipated at each end, plus actual movement time. Work should continue on critical aircraft repairs while other elements prepare the unit for movement. When movement is likely, aircraft requiring repairs that cannot be completed within 2 hours should be evacuated to AVIM.

(3) As a rule, during movements, communication and coordination between the AVUM element and the companies it supports are extremely difficult.

5-20. AVIATION INTERMEDIATE MAINTENANCE

Aviation maintenance companies (AVIM) provide support-level maintenance for AVUM and operating organizations. AVIM units are either divisional or nondivisional. In terms of maintenance responsibility, they serve as the bridge between units that own and operate aircraft on the battlefield with the production line and overhaul depots located away from the battlefield. The goal of AVIM units in combat is the same as that of AVUM units: to provide the battlefield commander with the maximum number of fully mission-capable aircraft. Divisional and nondivisional AVIM units perform similar support functions.

a. *Divisional AVIM Units.* A divisional aviation maintenance company (AVIM) is assigned as a separate company, or as subordinate company in the Aviation Support Battalion, organic to the DISCOM. This company is structured to support the specific aircraft assigned to the division. These aircraft are usually observation, utility, and attack helicopters. It supports the aviation brigade by providing AVIM and reinforcing AVUM-level support at its base location in the Aviation Brigade Support Area, BSA, and forward team support in the operating unit areas.

(1) *Base area maintenance*. The main body of the AVIM unit is located in one of the rear support areas, usually the BSA. The unit performs extensive on-aircraft systems maintenance, including structural and airframe repairs. It repairs components for immediate reinstallation on aircraft or to support a repairable management program. It also performs AVIM level scheduled maintenance. The unit may serve as the next-level processing agency for aviation brigade supply transactions under an automated system, including the receipt, storage, and issue of repair parts and the control and distribution of aviation intensive management items. This will occur if the unit is established as a separate company, and not as a ASB configuration. When the work load for an AVIM unit becomes too great, some of the work load may be cross-leveled, or transferred, to a nondivisional AVIM unit.

(2) *Forward team maintenance.* The AVIM unit dispatches teams forward to assist operating units with AVUM overload situations, aircraft combat maintenance and battle damage repair actions, and aircraft recoveries. The functions of AVIM aircraft combat maintenance and battle damage repair and recovery teams are the same as those for AVUM-level teams. Such forward support is on an as-requested basis. When a commander encounters or anticipates a need for AVIM forward assistance, he makes the request through procedures prearranged and detailed in external support agreements or SOPs. The commanders at AVUM and AVIM levels prepare

SOPs and coordinate them with all organizations concerned, ensuring that they are updated upon situational changes. Guidance includes--

- Request procedures and criteria.
- Communication nets.
- Team composition requirements.
- Tactical considerations.
- Equipment requirements.
- Team administrative support provisions.
- Any data unique to the requirement circumstances.

b. *Nondivisional AVIM Units.* The primary mission of the nondivisional aviation intermediate maintenance companies (AVIM) is to provide the full scope of support services to corps nondivisional aviation units. A secondary mission is to reinforce divisional AVIM companies. This reinforcing support may include forward team maintenance and back-up recovery actions. Under the ARI structure, "pass-back" activities must be kept to a minimum. The robustness of the corps aviation maintenance battalion, which can control from two to eight nondivisional AVIM units, will determine the extent of reinforcing support provided to divisional AVIM units. When adequately manned, nondivisional AVIM units can perform all functions normally tasked to divisional AVIM units. The cross-leveling of nondivisional work is managed by the corps aviation maintenance battalion. The divisional AVIM employment discussed above also applies to the nondivisional AVIM unit, except for differences in the organizational and battlefield placements of divisional and nondivisional AVIM maintenance elements.

5-21. AVIATION INTERMEDIATE MAINTENANCE MOBILITY

a. AVIM units are located to meet the requirements, and be responsive to, the aviation brigade. Frequent and rapid moves may disrupt maintenance activities. AVIM elements are required to be 100-percent transportable and 50-percent mobile to provide critical and rapid support to aviation units. AVIM units may have to relocate to the corps rear area, particularly during defensive operations, to ensure adequate facilities and time to complete heavy maintenance requirements such as phases. Normally, divisional AVIM units move every 3 to 7 days and corps AVIM units, every 8 to 10 days. However, METT-T and the commander's intent may dictate otherwise.

b. Major mobility-related factors should be considered. These are discussed below.

(1) Maintenance capabilities are greatly reduced during moves. At least a 6-hour loss of productive maintenance time can be anticipated, plus actual movement time.

(2) When movement is likely, provisions are made for the disposition of aircraft requiring repairs that cannot be completed within 4 hours. Depending on the specific situation, this disposition entails coordination with corps for use of medium-lift helicopters for air evacuation and preparation of aircraft for one-time flights. This requirement poses a significant problem; most of the aircraft at AVIM level are in for repairs that require more than 4 hours. Upon arrival at a new location, an AVIM commander assesses the capability of conducting the next move. Then he

coordinates the necessary support for the move prior to the requirement, particularly the evacuation of inoperable aircraft.

5-22. NIGHT AIRCRAFT MAINTENANCE

a. Army doctrine calls for full around-the-clock aviation operations. This doctrine requires 24-hour-a-day aircraft maintenance capabilities. Working on aircraft day and night appreciably shortens calendar repair time for aircraft undergoing major maintenance. Maintenance completed at night on aircraft that have flown all day allows those same aircraft to be assigned to missions early the next day.

b. Light discipline is imperative to night maintenance activities on the modern battlefield. When a unit operates close to the FLOT, light suppression precautions must be more restrictive. Maintenance actions should be centered around performing tasks inside closed blackout shelters (when available), as opposed to working outside with subdued lighting devices. Units work with self-powered light under lightweight portable blackout enclosures that can be easily moved from one aircraft or location to another. Forward night maintenance inside large (full aircraft) lighted blackout shelters is only performed if enough internal lighting can be provided without the need for noise-producing power generators.

c. The scenario plays a major role in determining the extent of night maintenance that can be performed safely and effectively. The open desert terrain of the Mideast scenario lends itself to long-distance visibility of the faintest light; that same light is not detectable from a comparable distance in the forested, hilly European scenario.

d. Certain tasks can be done at night if light discipline is used. However, maintenance jobs that require rotor blade turning or engine run (rotor track, fuel control adjustment) are done outside and generally require significant area lighting. Thus adequate light discipline is imposed and tasks are delayed until daylight.

e. There is no single, all-encompassing definitive concept for night aircraft maintenance operations. Each organization establishes and alters its plan for implementing night operations as specific environmental conditions and changes in threats are encountered. That is, as a unit moves forward into more open terrain, its night maintenance considerations are considerably different from when it moves rearward or into a more closed environment.

f. In developing procedures and criteria, the safety-of-flight standards must be maintained at the same level as those for daytime maintenance; also the security of the unit must not be compromised. FM 1-500 contains detailed night maintenance considerations. Commanders establish comprehensive, flexible procedures for conducting night maintenance operations. The procedures include-

- Light discipline criteria.
- Production control adjustments.
- Quality control requirements.
- Changes of day-night shift transitions.
- Impact of human factors.

5-23. MAINTENANCE IN UNUSUAL ENVIRONMENTS

a. Commanders are aware of the unique implications of performing aircraft maintenance in unusual environments. They ensure that preparations are made before operating in such areas. Often, maintenance procedures employed in one environment are not appropriate for another. Operations may be conducted in climatic or terrain extremes.

b. FM 1-500 lists special considerations for operating in such areas. Commanders look at the effect of the environment on factors such as-

- Modifications to normal repair parts stockage levels (for example, increased numbers of filters, bearings, and seals when operating in wind and sand).
- Mobility and transportation restrictions (mountains, heavy foliage, ice).
- Personnel and equipment performance degradation (altitude, excessive heat or cold).
- Light discipline requirements for night operations.
- Communications restrictions.
- Special shelter requirements.
- Modifications to normal scheduled and preventive maintenance schedules.
- Specialized equipment and clothing requirements.

5-24. TRANSPORTATION PRINCIPLES

a. Transportation is the movement of personnel, materiel, and equipment from origin to destination. As a rule, it is expressed in tonnage (or number of personnel) and distance. Every logistics or personnel requirement generates at least one transportation requirement.

b. The three types of transportation operations within the theater are ***movement management***, ***terminal transfer operations***, and ***modal operations.***

    (1) ***Movement management***. MCCs in the EAC Support Command, COSCOM, and DISCOM manage movement. Movement management consists of staff planning and coordination for effective use of the transportation system.

    (2) ***Terminal transfer operations.*** These operations consist of shifting cargo from one mode of transport to another or shifting cargo from one type of transport in a mode to a different type. Shifting occurs at any intermediate point along the transportation system.

    (3) ***Modal operations.*** Modal operations encompass the movement of personnel and materiel on a transportation conveyance. Four basic modes of transportation support these requirements: motor, air, water, and rail.

c. Transportation planning consists of five steps. These steps are in the following paragraphs:

    (1) ***Determination of requirements.*** Initial transportation requirements are expressed in tonnages (or number of personnel) and distances. Requirements also are modified to include time or special handling requirements such as required delivery dates or oversized loads.

(2) *Determination of available resources*. Transportation resources are assessed. The type of transportation assets available and their characteristics and capabilities are considered.

(3) *Balancing of requirements against resources.* This process weighs various factors against resources available to support the stated requirement for additional transportation. Factors consist of the required workload capacity, command priorities, and availability of both organic and supporting resources. Decisions are made as to the amount and type of support to be provided; for example, whether to make two round trips with organic trucks or one trip with external support because the supplies exceed organic hauling capability and no other trucks are available.

(4) *Determination of critical points.* This process looks at the transportation plan. It identifies critical points when additional planning is needed to preclude bottlenecks and to ensure that the transportation system is operating at maximum capacity. Alternate plans are devised to accept various contingencies and to add flexibility to the plan.

(5) *Coordination and refinement of the plan.* All planners must coordinate so that support is integrated. After initial coordination takes place, constant coordination and feedback are needed. Thus all contingencies that may arise because of changing situations and the fluid nature of the battlefield can be handled.

5-25. UNIT MOVEMENTS AND TRANSPORTATION

a. *Requirements.*

(1) Aviation brigade units begin training for their combat mission from the time they are activated. The mission may include actively engaging the enemy or providing support. In either case, units deploy to where they can best accomplish their mission. Unit deployment training is necessary if units are to move in the most efficient manner. Whether a unit is deploying from CONUS or 3 kilometers (kms) on the battlefield, if it cannot move within its operational requirements, the success of the mission is jeopardized. Frequent training and exercising of unit deployment plans reduce the chances of such an occurrence.

(2) Aviation, unlike other forces, has some self-deploying capabilities. With preparation, some aircraft, personnel, or equipment or a combination of these can self-deploy from CONUS stations to almost anyplace in the world. Aviation forces must plan and train for self-deployment. Because aviation forces can self-deploy, they free other transport assets for other missions. The commander and his staff must thoroughly plan all aspects of the movement if self-deployment is the chosen method of transportation. Appendix E further describes self-deployment.

(3) Units that plan, train, and validate their movement plans will greatly increase their chances of success. All unit personnel are involved at some phase of a unit movement; key personnel must become knowledgeable of all phases. The more familiar each soldier becomes with the unit's movement plans and operations, the

more efficient the movement becomes.

(4) Aviation units often move throughout the battlefield because of the demands of tactical operations. The frequency depends on METT-T; however, they may move as often as twice a day. To conduct movements of supplies, equipment, and personnel, aviation units are equipped with organic wheeled vehicle assets that will expedite aviation operations. These assets will carry equipment required to support, sustain, and survive during deep, close, and rear operations. Units that are operating in their entirety forward of the DSA, even for short periods, require rapid and total unit mobility (100 percent) to survive and sustain combat operations.

(5) Operational aviation units require organic mobility for several reasons. First, mobility is the primary means of avoiding detection and targeting of aviation support assets by threat acquisition devices. Thus survivability of vital aviation support assets is increased. Second, mobility reduces dependence on the supporting transportation system. Third, mobility allows assets to be relocated quickly, often over relatively great distances; therefore, adequate and timely support is provided.

b. *Responsibilities.*

(1) Commanders are responsible for the movement of the personnel and equipment of their units. They also-

(a) Review and validate movement plans, SOPs, and load plans often.

(b) Supervise the operation of subordinate units.

(c) Establish policies for air lines and sea lanes of communications operations.

(d) Coordinate with other headquarters for technical data and logistics support.

(e) Ensure compliance with directives, policies, and regulations.

(f) Appoint a unit movements officer.

(g) Review equipment authorization documents and recommend changes.

(2) Staffs ensure that the commander's directives are carried out. They develop unit movement plans, which include-

(a) Planning and supervising unit movement training.

(b) Determining and coordinating logistics support requirements.

(c) Establishing training programs for unit movement personnel.

(d) Recommending improvements to the commander.

(e) Ensuring compliance with directives, policies, and regulations.

(f) Ensuring that subordinate unit movement plans, load plans, and SOPs are accurate and current.

(3) Unit movement personnel plan and conduct unit moves. They also-

(a) Develop unit movement plans, SOPs, and load plans.

(b) Conduct unit movement training.

(c) Ensure that proper support and logistics requirements are requested.

(d) Validate movement plans.

(e) Inspect and inventory equipment before and after a unit movement.

(f) Ensure that personnel and equipment are properly prepared before a movement.

c. *Planning and Preparation.*

(1) Aviation forces must plan and prepare to arrive at designated locations in the area of operations and begin tactical missions at the same time. Modes of movement and deployment are designated in orders. Unit movement orders are delivered in several formats. These orders are provided in an OPORD, a movement order, or a FRAGO. Because of the complexity of unit movements, the movement order is preferred. Movement orders provide detailed information such as transportation support, movement tables, and clearance numbers. The least preferred method is the FRAGO.

(2) The information below will assist planners in preparing directives and SOPs.

(a) The movement directive is the basic document, published by DA, that directs units to prepare to move from home stations in one of the following categories:

- ***Category A*-**a move from a home station with all equipment that is authorized to that unit.
- ***Category B*-**a move from the home station with minimum essential equipment only.
- ***Category C*-**a move from the home station with less than minimum essential equipment. Specific guidance as to what is to be taken will be given in the movement directive.

(b) In an administrative move, enemy contact is not likely. Units are relocated into secure areas and ports of embarkation. The G4 or S4 has staff responsibility for such movements.

(c) A tactical move requires a combat-ready posture and organization during all phases even though the purpose is relocation and not enemy contact. The G3 or S3 has staff responsibility for these operations.

(d) Movement instructions consist of detailed instructions for executing a movement. They are issued as an implementation of the movements program and represent accepted procedures to be followed.

(e) Movement orders are instructions for the movement of personnel and prescribed equipment from one location to another within a stated period of time.

(f) The movement plan is up-to-date logistics data reflecting a summary of transportation requirements, priorities, and limiting factors incident to the movement of one or more units or a special grouping of personnel by highway, marine, rail, or air transportation. FM 101-5 contains an example of a movement plan.

(g) The load plan is a preplanned method for loading personnel and equipment on transport equipment.

d. *Self-Deployment.*

(1) Because airlift and sealift assets are limited, selected aviation brigade units may need to plan to self-deploy. Studies and operations have established the feasibility of this option; the extended-range fuel system enables aviation to self-deploy.

(2) The UH-60 Black Hawk, AH-64 Apache, and CH-47 Chinook aircraft currently are provided with the fuel, ALSE, navigation, and communication systems for self-deployment. They will move from continential United States (CONUS) stations to designated departure points to prepare the aircraft. Pre-stationed ground and aerial support and maintenance teams provide stopover point assistance. Self-deployment flights terminate at destination points where ferry equipment is removed and arrangements are made for its return for reuse. Self-deployment applies only to aircraft transferred when other transport assets are not provided; these aircraft may transport a small amount of equipment and personnel.

(3) A command structure must exist to integrate the self-deploying aircraft and crews into the theater of operations. This integration will enhance the availability and effectiveness of these aviation assets in their operational area. Again, Appendix E contains detailed information about self-deployment.

e. *Airlift.*

(1) Air movement is an operation executed according to prepared plans designed to ensure air transport of supplies, equipment, and personnel. A unit must be able to package, document, load and off-load, and tie down equipment. Air movement is the only military transportation that can respond as rapidly as the situations of the world demand. Air movement of units requires planning by all levels of command. Units are trained not only in mission accomplishment but also in the skilled execution of airlift deployment.

(2) The Air Mobility Command (AMC) provides the air assets (C-141, C-17, C-5) to move personnel and materiel in emergencies or to meet operational requirements. These assets are limited in number and availability. AMC aircraft accept only equipment that is within their space and weight limits. AMC aircraft are spread around the world to support existing requirements. All Army rotary-wing aircraft can

be transported by air. Table 5-5 depicts an airlift loading chart.

(3) The unit movement officer is the key to executing the unit's movement and loading plans. He supervises and conducts training and maintains updated movement data. Because operational requirements may exceed airlift capacity, the unit movement officer maintains plans for other types of transportation. FM 55-9 contains detailed information on unit air movement planning.

(4) Specific planning and support requirements for each unit vary. The unit movement officer is aware that in case of a contingency there is only minimum time to plan. To prepare the unit for movement operations, he identifies requirements and routinely develops and validates exercise plans.

f. *Rail Movement.*

(1) The division or installation transportation officer or DISCOM movement control officer assists movement officers with planning and identifying unit rail loading requirements. He provides information to minimize planning time. He also provides training material and current procedures for transporting equipment.

(2) When available, rail shipment moves heavy and outsized items to the port of embarkation. Because rail shipment can damage sensitive aircraft components, aircraft are flown to those areas for airlift purposes.

(3) The aviation unit is responsible for internal administration and preparation of unit assets for rail movement as with other forms of movement. Plans and SOPs address all rail requirements such as loading, tie-downs, organization, and safety. Rail movement plans are completed as required by the controlling transportation agency.

(4) FM 55-20 assists the unit movement officer in planning and preparing equipment for rail transport. It also provides background information on requirements for foreign countries.

g. *Sealift.* Only minimum sealift planning and training can be performed. This is due mainly to the many types of merchant vessels. Planning and training are limited to on-site surveys and data on ports of embarkation and debarkation and, to a limited extent, the vessels likely to be employed. The deploying unit will have to prepare accurate cargo loading movement data. Because there are limited planning requirements, higher headquarters should provide guidance and assistance in sealift planning. Particular planning considerations must be considered such as protection for aircraft during sea movement; for example, shrink-wrap.

h. *Convoy Movements.*

(1) A convoy is always organized for a specific purpose and according to a specific plan. For aviation, it may be a part of an overall plan to relocate before an attack or a movement from the home station to the port of embarkation. A convoy is defined as a group of two or more vehicles organized for control under a single commander. The convoy commander may be the battalion commander or executive officer, a company commander, a platoon leader, or an NCO, depending on the size of the convoy.

(2) Unit moves by convoy require a great deal of time and practice. Much of the time will be used for planning. Movement officers should become familiar with FM 55-30 for assistance in planning unit moves by wheeled vehicles. The manual will assist them in planning and conducting convoys and in determining organizational requirements.

(3) Control of motor movement can be exercised in two ways. It can be exercised by the organization making the movement; or it can be exercised by the commander of an area through which the convoy will proceed.

(4) Organizational control is always exercised during motor movements. The unit SOP addresses many of the control measures. These measures eliminate the need to consider some topics when the movement order is issued. Subjects in the unit SOP include-

- Staff actions.
- Route reconnaissance.
- Convoy commander's briefing.
- Halts.
- Release point.
- Fire support coordination.
- Coordination with other combat forces.
- Messing en route.
- Maintenance en route.
- Refueling en route.
- Medical support en route.
- Convoy organizations.
- Preparation of vehicles and equipment in an NBC environment.
- Vehicle load plan requirements.
- Route selection and clearing.
- Liaison.
- Movement C^3.
- Advance party procedures.
- Night movement operations.

(5) The planning and coordination involved in a convoy operation require aggressive staff actions. However, a unit SOP can eliminate much of the burden.

i. *Training.* There are no special training requirements for unit movement personnel. However, personnel designated on orders must sign DD Form 1387-2 (Special Handling Data/Certification) certifying that hazardous cargo is properly prepared for shipment. The Joint Military Packaging Center, Aberdeen Proving Ground, Maryland, instructs in the preparation for transport of hazardous cargo; or one of their mobile training teams provides

this training locally. Also, the USAF conducts the Military Airlift Command (MAC) airload planner's course, which benefits unit movement officers in planning movements using USAF assets. The Army training catalog, AR 351-1, lists other training. Publications on unit movement, which are not all-inclusive, are listed in the References.

SECTION V. Personnel Service Support

5-26. PERSONNEL SERVICE SUPPORT PRINCIPLES

Personnel service support is the personnel-oriented CSS function. It affects the personnel replacement operations of units and their missions as well as the morale and welfare of their soldiers. Normally, the unit S1 coordinates personnel services. PSS is divided into critical and essential personnel functions as discussed below.

a. *Critical Personnel Functions.*

(1) *Personnel accounting and strength reporting.* Personnel accounting and strength reporting accounts for soldiers and reports their duty status as the foundation for critical battlefield decisions. This function includes operating a C^2 strength reporting system (both hasty and deliberate) to manage the personnel combat power of the tactical force. The reporting system reconciles deliberate personnel accounting and hasty strength reporting information over time and supports the Army's personnel life-cycle function of sustainment. The brigade S1-

(a) Receives and consolidates hasty strength information from the battalions.

(b) Advises the commander on personnel strength matters.

(c) Compares the results of C^2SRS processing against the hasty strength information for each battalion. He identifies obvious discrepancies between hasty and data base information and directs reconciliation, if appropriate.

(2) *Replacement operations.* Replacement operations encompass the coordination of support and delivery of replacements and return-to-duty soldiers. These operations include orders issuance, personnel accounting, logistics support, processing, and transportation. They also support the Army's personnel life-cycle function of distribution. The brigade S1 ensures that transportation requirements are satisfied for the movement of replacements forward of the BSA.

(3) *Casualty management and casualty operations.* Casualty operations include records, reports, and accounting for casualties in an expeditious manner. Casualty management coordinates personnel and logistical processes involved in these operations at all levels. Both casualty management and casualty operations support the Army's personnel life-cycle function of sustainment. The brigade S1 is responsible for the following functions in support of personnel:

- Collecting hasty and written casualty feeder and witness reports.

- Recording duty status changes in the personnel data base.
- Submitting casualty reports to the personnel service company (PSC).
- Managing open cases (for example, missing and evacuated) until final disposition is made.
- Preparing letters of sympathy.
- Accepting and forwarding changes to emergency data information.

(4) *Strength management.* Strength management assesses personnel combat power, plans for future operations, and assigns replacements on the battlefield. It predicts the need for replacements; it provides a mixture of individuals and small units as replacements to sustain combat power. It also supports the Army's personnel life-cycle function of distribution. The brigade S1-

- Continually collects and correlates critical personnel strength information.
- Advises the commander on the personnel status of the brigade.
- Recommends replacement priorities.
- Provides brigade replacement priorities to the division G1 or AG.

(5) *Personnel data base management.* Personnel data base management consolidates current and projected personnel information on soldiers and units in a number of command data bases (Standard Installation/Division Personnel System (SIDPERS)). These serve as the basis for command decisions and projected battlefield requirements. The brigade S1-

- Receives updates from all battalions.
- Plans for and manages all continuity of operations plans requirements.
- Backs up electronic files.
- Delivers updates to the supporting PSC by way of the G1 or AG (rear area).

(6) *Medical services.* Medical services are those services performed, provided, or arranged for despite location. Medical services promote, improve, conserve, or restore the mental and physical well-being of individuals or groups.

(7) *Combat Health Support.* The combat health support system consists of levels of support or echelons of care. They extend rearward throughout the theater to the CONUS base. Each level of support contains the same capability as the lower levels plus a new capability that sets it apart from the lower level. Each command level also has the same capability as the lower level. The CHS is divided into five levels. Medical capabilities increase from lower to higher.

(a) *Level I (Unit Level).* The emphasis of this level is on those measures-maintain airway, stop bleeding, prevent shock-necessary to stabilize a patient for evacuation to the next echelon of care. Soldiers receive training in first aid procedures that emphasize lifesaving tasks. Selected individuals in nonmedical units receive enhanced training. They are called combat lifesavers. All combat units and some CS and CSS units have combat lifesavers. Their primary duty does not change. They perform additional duties of combat

lifesavers when the tactical situation permits. The combat medic is the first individual in the CHS chain who makes decisions based on medical MOS-specific training. The treatment squad provides advanced trauma management (ATM) to battlefield casualties and routine sick call when not engaged in combat. Within the division, most combat battalions have a medical platoon that can run a battalion aid station, and provide medics to the companies and some ambulance support.

(b) *Level II (Division Level).* Clearing stations provide Level II care. They evaluate a patient's status to determine his priority for continued evacuation. They continue emergency care/resuscitation and provide initial urgent surgery. This level of care also includes limited dental, laboratory, optometry, preventative medicine, health service logistics, and mental health services. Medical companies and troops of divisions, separate brigades,ACRs, and area support medical battalions provide this care. Division health service support includes evacuation of patients from unit treatment stations to initial resuscitative treatment in division medical facilities. It also includes tailgate medical support and division medical support on an area basis to units without organic medical personnel. The medical companies of the medical battalion or MSB and FSB set up treatment stations in the BSA and DSA to provide this support. These treatment stations coordinate the care and evacuation of patients. They generally have a physician on hand to perform the surgery necessary to stabilize the patient for evacuation.

(c) *Level III (CORPS Level).* This level includes area medical support, hospitalization, air and ground MEDEVAC, health service logistics, dental services, preventative medicine services, veterinary services, and combat stress control. Combat support hospitals admit and treat all categories of patients. They either RTD patients or evacuate them to an echelon IV hospital. The mobile army surgical hospital provides early resuscitative surgery for those patients who require surgical intervention to stabilize them for evacuation. It usually locates in the division rear area.

(d) *Level IV (COMMZ Level).* Echelon IV hospitals provide general and specialized medical care. Their are two different hospitals at Level IV. One reconditions and rehabilitates soldiers who can return to duty within theater evacuation policy. The other treats and stabilizes patients for evacuation to Echelon V (CONUS base). The focus of level IV support is on the forward deployed corps.

(e) *Level V (CONUS Level).* Definitive care to all categories of patients characterizes Echelon V care. CONUS based DOD and Department of Veterans Administration hospitals provide this care. During mobilization, the National Disaster Medical System may be activated. Under this system, civilian hospitals care for patients beyond the capabilities of DOD and DVA hospitals. Strategic and operational planning and deployment of CHS assets also take place at this level.

(8) *Evacuation.* Patients with wounds of lesser severity may not need to pass through all echelons of care. They are returned at the lowest level that meets their need. The patient's condition and METT-T are important factors in selecting the evacuation platform. Centralized management and matching the patient's condition and urgency of movement with the available evacuation assets ensure the effective and efficient usage of scarce medical resources. In the main battle area, patients normally do not bypass Echelon I or II MTFs. This ensures that they have a better chance to be stabilized for further evacuation. Despite the exceedingly unfavorable circumstances of war, the system usually moves patients from one echelon of care in the main battle area to another within 1 hour or less.

(9) *Medical supplies (Class VIII).* Class VIII is a commodity-oriented system. It follows a more direct distribution path to the user than would otherwise be provided by the general supply system. The management, to include requisition and distribution, is accomplished within the medical system at all echelons.

b. *Essential Personnel Functions.*

(1) *Legal services.* Legal services are normally handled by judge advocate general officers within the division. These officers interpret and prosecute war crimes, provide legal defense services, and act as judicial officials for courts-martial.

(2) *Chaplain activities.* Chaplains are normally assigned to aviation brigades. They provide religious, morale, and counseling services to units and individuals.

(3) *Financial management.* Overall resource management is provided by the corps or division resourse managers. Some nondivisional aviation brigades may have their own resource management cells performing limited functions like tracking expenditures. The Brigade S1 arranges for and coordinates finance support to the brigade. This support is provided by units of the corps finance group. Typically, a finance detachment from a finance battalion supports a brigade. Finance support can be provided at the unit location by finance support teams or at the finance detachment. This support includes-

(a) Paying local procurement requirements.

(b) Funding paying agents.

(c) Replenishing imprest funds.

(d) Providing combat payments to soldiers.

(e) Providing pay support (inquiries, allotment changes, leave and earning statements (LESs)).

(f) Cashing personal checks.

(4) *Morale, welfare, and recreation support.* MWR gives soldiers' commanders access to and use of morale, welfare, and recreation activities to assist in relief from mission stress, subject to combat intensity. These services include-

- Recreational equipment.
- Reading material.
- Motion pictures.
- Live entertainment.
- Retail sales.

(5) Public affairs. This service includes censorship of information for operations security (OPSEC) reasons. It also includes press releases and newspaper publication to inform military personnel and civilians.

(6) Postal services. Postal operations provide for the management and operation of a postal network to move, deliver, and collect mail in the deployed force, which contributes to the fighting will of soldiers. These operations deliver official mail, to include critical spare parts and medical supplies, and are an alternate delivery system for personnel information. These operations also support the Army's personnel life-cycle function of sustainment.

(7) Administrative services. These services include reproduction, distribution, publication distribution, and classified documents control.

(8) Other personnel services. FM 12-6 has details on other personnel services. These include:

- Awards and decorations.
- Officer and noncommissioned officer evaluations.
- Officer and enlisted promotions.
- Line of duty investigations.

5-27. FIELD SERVICES

Field services are logistics support functions required to support an armed force, excluding supply, maintenance, and transportation. The two categories of field services are discussed below. Normally, the field service capability organic to the division includes clothing exchange and bath supplies; graves registration; and salvage, when augmented. The COSCOM provides the rest of the field service support for the division.

a. **Primary Field Services.** These services include airdrop and mortuary affairs (MA). They support combat operations.

(1) Airdrop. The division receives its airdrop support from a quartermaster airdrop supply company normally assigned to the COSCOM. These companies are organic to the airborne and air assault divisions. They are able to rig loads for airdrop and low-altitude parachute extraction system operations by USAF cargo aircraft. FM 100-17 covers airborne insertions in detail.

(2) Mortuary Affairs.

(a) The Army always takes proper care of its dead. MA units operate collection points, a mortuary, and a personal effects depot at the operational level. All

commanders are responsible for the search, recovery, tentative identification, care, and evacuation of remains to the nearest collection point or mortuary. MA personnel initially process remains in theater. Then they arrange to evacuate remains and personal effects, usually by air, to a CONUS point of entry mortuary. Recent wars and SASO have shown this policy is quite effective. Each division has a small MA element (two to three personnel) organic to the DISCOM. They train division personnel to perform initial search, recovery, identification, and evacuation of human remains. During hostilities, MA personnel organic to the division operate the initial collection point. The recovery and return of the human remains to a collection point remains a basic unit function. This procedure continues until the division receives additional MA personnel or a MA unit. A MA unit assigned to the COSCOM supports nondivisional units on a area basis. This unit operates collection points throughout the corps, division, and brigade areas. These points receive remains from the maneuver units, assist and conduct search and recovery operations, and arrange for the evacuation of remains to a mortuary or temporary burial site.

(b) Deceased personnel may have to be buried by their fellow soldiers on or near the site of death (for example, NBC-contaminated remains). For hasty burials, the next higher headquarters should be informed of the location of the burial site.

(c) MA teams are formed in the units to search for and identify remains and to transport them to MA collection points. Team members have a compass for determining azimuths, a map of the search area, paper for sketching the recovery area, entrenching tools, and paper tags with string or wire fasteners for tagging remains. Team members are also issued personal effects bags, human remains pouches (body bags), NBC agent tags, and MA forms.

(d) Personnel carry remains feet first at all times. An attitude of reverence and respect is maintained during loading. Remains are loaded on trucks feet first; on fixed-wing aircraft, remains are loaded head first. On helicopters, remains are loaded feet first, if possible. Care is taken that no remains, or litter, are touching another remains or litter. The vehicle transporting the remains is always covered. Personal effects and identification tags are kept with the remains during evacuation. An escort is sent with the remains during evacuation to provide security against theft and unauthorized entry to the vehicle. This escort should comprise personnel who witnessed the circumstances of the death of the individuals.

b. *Secondary Field Services.* These services include clothing exchange and bath, laundry and reimpregnation, bread baking, light textile and clothing renovation, and salvage. Secondary field services are not immediately critical to combat operations; deferring them does not materially interrupt combat operations.

c. *Force Provider.* The Army's Force Provider will provide the frontline soldier with a brief respite from the rigors of a combat theater. It is also ideally suited for supporting SASO,

particularly disaster assistance and humanitarian aid operations. This system-which can provide support for 3,000 persons-is modular in design. Each modular can operate independently and support 550 people. The unit includes billeting facilities with heating and cooling, kitchens, latrines, showers, laundries, power generation, and water storage and distribution.

Appendix A

Aviation-Ground Task Forces

This appendix contains sections that focus on the aviation brigade's planning and operations when controlling ground maneuver units as part of a task force.

A-1. OVERVIEW

a. The aviation brigade—

(1) Is normally is the controlling headquarters for divisional or corps aviation units.

(2) In this capacity, has limited ground maneuver capability.

(3) Concentrates almost exclusively on air maneuver and ground-delivered logistics with the exception of the ground troops assigned to the cavalry squadron.

b. The aviation brigade headquarters—

(1) Commands and controls aviation units throughout the battlespace.

(2) Has the capability to command and control (C^2) attached units and those under its operational control (OPCON).

(3) Must prepare to receive ground maneuver forces—including companies and battalions—when an aviation brigade is employed as a task force (TF) headquarters.

(4) Must integrate these forces—which include light and/or mechanized units—into their scheme of maneuver.

c. The employment of ground forces by the aviation brigade headquarters can provide the force commander with an integrated air-ground capability. Normally, the heavy battalion TF is employed under a parent heavy brigade in terrain suitable for mechanized maneuver. However, mechanized units are restricted when they encounter urban areas, dense forests, or rugged terrain. In these environments, it may be tactically advantageous to attach these forces to the aviation brigade headquarters.. This allows the forces to capitalize on the superior reconnaissance and direct fire capability of the aviation brigade's helicopters.

A-2. OPERATIONS

a. The two offensive operations normally conducted by the aviation brigade with attached ground maneuver forces are attack and movement to contact. The primary use of a ground unit attached or OPCONed to the aviation brigade will be as a maneuver force to meet the division or TF commander's intent in these two operations. The attached infantry or armor battalion normally will use one of four methods of maneuver when operating with the aviation force. These include—

(1) The aviation force attacks by fire while the ground force infiltrates and assaults the objective. This maneuver includes air assault.

(2) The aviation force attacks by fire while the ground force advances for the assault.

(3) The aviation force and ground force approach the objective on different axes.

(4) The aviation force and ground force advance together.

b. Besides maneuver, the ground force—attached or OPCONed to the aviation brigade—can assist in defensive operations controlled by the aviation brigade. These operations may include—

(1) *Area defense.* An example of an area defense is the defense of the aviation brigade assembly area. This type of defense is most likely during periods of intensive maintenance when aviation soldiers are focused on repairing helicopters for an upcoming mission. Units normally conduct an area defense when—

- Directed to defend specified terrain.
- The enemy enjoys a mobility advantage over the defending force.
- Well-defined avenues of approach exist.
- The defending force has sufficient combat power to cover the likely enemy avenues of approach in sector.

(2) *Mobile defense.* The mobile defense orients on the defeat or destruction of the enemy force; it allows the enemy to advance to a point where it is exposed to a decisive attack by a striking force. A commander organizes his unit into two forces: the *fixing* force and the *striking* force. An example of a mobile defense is the use of a mechanized battalion task force attached to the aviation brigade as a *fixing* force; it canalizes the enemy. The aviation force would be the *striking* force; it provides lethal fires to destroy the enemy force.

SECTION I. General Task Force Planning Factors

This section discusses initial planning considerations for the general task force. The aviation brigade commander and staff must know, and constantly focus on, the attached unit's doctrine, characteristics, battlefield focus, capabilities, and limitations. Mutual planning, development of orders, rehearsals, and coordination between respective commanders and staffs must take place to capitalize on advantages and offset weaknesses.

A-3. BATTLE COMMAND

For combat service support (CSS) reasons, OPCON is the proper command relationship when

a mechanized battalion is subordinate to an aviation brigade for 3 days or longer. Logistics for light units is easier for the aviation brigade to supply—particularly for classes III and V. However, 3 days is still valid for planning. For missions of shorter duration, attachment may be appropriate whether dealing with a mechanized or light force.

a. Collocate the attached unit's main command post (CP) with the aviation brigade tactical operations center (TOC) when feasible. As a minimum, exchange permanent liaison officers.

b. Jointly conduct the planning process.

c. Coordinate the development of orders and overlays.

d. Exchange codes, recognition signals, and signal operation instructions (SOIs).

e. Provide a retransmission site, if required, to maintain voice radio contact with the ground unit.

f. Conduct radio rehearsals early to ensure nets are functioning properly.

g. Use the ground force's guides when moving vehicles through areas controlled by the ground forces (their assembly area).

A-4. MANEUVER

a. Ensure that the attached unit is assigned terrain, commensurate with its capabilities, within the aviation brigade's area.

b. When planning any operation involving linkup with an aviation force, time the operation to avoid leaving the ground force in a vulnerable position. Always consider the mobility disparity between aviation and ground units.

c. Direct and indirect fires from both units should be mutually supporting. The aviation brigade may employ its attack helicopter battalion by using its long-range direct fires to provide suppression and overwatch fires for the ground force during an assault.

d. Be prepared to provide long-range precision fires for the ground force during their maneuver.

A-5. FIRE SUPPORT

a. Jointly develop target lists and fire support (FS) execution matrixes. FS execution should be centralized under aviation brigade control.

b. Jointly develop restrictive fire control measures. Ensure that they are universally understood. Ensure the control measures are standard between the air and ground forces.

A-6. MOBILITY AND SURVIVABILITY

a. Develop a common obstacle plan. Upon attachment of the ground force, request an engineer officer to serve on the aviation brigade staff.

b. Coordinate counterattack routes through restrictive terrain and obstacles. Consider using the sappers and dismounted infantry to clear chokepoints and obstacles for the ground force.

c. Consider weapons' range disparities when handing over the overwatch of obstacles to the ground force from an aviation unit.

d. Ensure aviation air routes (ingress and egress) are clearly understood by the attached ground forces.

A-7. INTELLIGENCE

a. When conducting intelligence preparation of the battlefield (IPB), include the ground unit's S2 staff. Ensure they provide input into the TF IPB. Key on considerations for ground maneuver that may not be readily apparent to the aviation brigade staff.

b. Jointly develop reconnaissance and surveillance plans with the ground maneuver staff.

c. The aviation brigade staff should take advantage of the ground maneuver unit's dismounted reconnaissance capabilities. This can also include counterreconnaissance patrolling in rugged, urban, or densely vegetated terrain.

A-8. LOGISTICS

a. Be prepared to assist ground maneuver units with moving bulk supplies forward. This is particularly true for Classes I, III, and V; bulk supplies may include Class IV barrier materials as well as critical Class IX.

b. Collocate ground and air aid stations, if feasible.

c. Ensure that necessary logistics support from the ground maneuver unit's parent brigade is continually monitored and not interrupted.

SECTION II. Mission Selection

A-9. OFFENSIVE MISSIONS

With an attached ground maneuver force, the aviation brigade has many potential offensive missions. Examples of these offensive operations include—

a. The aviation brigade conducts a coordinated attack on an objective. The attack is conducted after an attached light infantry battalion has conducted an air assault with brigade assault helicopter assets. During execution of the ground tactical plan, the aviation brigade's attack helicopter battalion can support, by fire, the infantry's advance onto the objective.

b. The aviation brigade's attack helicopters provide long-range overwatch, suppression,

or fixing fires. These actions are for an attached mechanized battalion attacking through restrictive terrain.

c. The aviation brigade's battalions maneuver against an enemy. The enemy has been fixed by the ground maneuver force.

A-10. OFFENSIVE MEASURES

a. Stringent control measures are necessary because—

(1) Differences exist in mobility and firepower between ground units and aviation units.

(2) Ground and aviation units will be maneuvering near each other in a chaotic situation often during limited visibility.

b. Fratricide-reducing measures may include—

(1) Mandated routes (ground and air).

(2) Specified support by fire or battle positions.

(3) Restrictive fire lines (RFLs).

(4) Airspace control areas (ACAs).

(5) Limits of advance.

c. A clearly defined chain of command must exist for calling for and clearing supporting fires. The responsible unit and commander must be identified for effective synchronization of fires particularly during simultaneous air and ground maneuver.

A-11. DEFENSIVE MISSIONS

With an attached ground maneuver force, the aviation brigade has many potential defensive missions. Examples of these defensive operations include—

a. A coordinated air-ground counterattack conducted with the aviation brigade acting as the division's main effort.

b. Long-range antiarmor fires for ground forces in a deliberate defense provided by attack helicopters from the aviation brigade. This may include observation of obstacles and axes of advance reconnaissance.

c. A coordinated air-ground deliberate defense of a sector or battle position. (**NOTE:** While pure aviation units cannot hold terrain, they are suitable for denying terrain.)

d. An air assault conducted to reinforce a deliberate defense by a ground force.

A-12. DEFENSIVE MEASURES

The aviation brigade commander should be aware of the ground maneuver force's available mobility and firepower when assigning its defensive mission. The type of defense employed will

depend on the attached ground force's (light or heavy) capabilities. Considerations for the defense include—

a. Employment of long-range fires from attack helicopters to support the defense of the ground unit.

b. The counterattack role—assigning the attack helicopter battalion an engagement area into which the ground maneuver force canalizes the enemy.

c. Fratricide-reducing measures, which may include—

(1) Mandated routes—ground and air.

(2) Specified support by fire or battle positions.

(3) RFLs.

(4) Limits of advance as in offensive operations.

d. A clearly defined chain of command must exist for calling for and clearing supporting fires. The responsible unit and commander must be identified for effective synchronization of fires. Particularly during simultaneous and air and ground maneuver, responsibilities must be clear.

e. Reconnaissance and rehearsals for the defensive area can be performed with the aviation brigades' helicopters.

A-13. RECONNAISSANCE AND SECURITY MISSIONS

With an attached ground maneuver force, the aviation brigade has many potential reconnaissance and security missions. These missions are beyond those conducted by the cavalry or reconnaissance squadron. Examples of these operations include—

a. Conducting an aviation brigade controlled zone reconnaissance. The reconnaissance may incorporate the cavalry squadron, the attack helicopter battalion, and the attached ground force. The aviation forces provide long-range surveillance, while the ground forces accurately assess cross-country trafficability of the zone's terrain.

b. Conducting an area reconnaissance of a minefield or similar obstacle belt. The ground force focuses direct fires on the obstacle; at the same time, organic aviation brigade helicopters provide overwatch and long-range surveillance.

c. Conducting a stationary screen in rugged terrain. Attached light infantry and aviation brigade organic attack and assault helicopters are used in this mission.

d. The aviation brigade's acting as a covering force during both defensive and offensive operations; the brigade uses attached ground forces and a direct support (DS) artillery battalion during these operations.

SECTION III. Mission Planning

A-14. DESIGNATION OF TASK FORCES AND TEAMS

When aviation brigades accept ground maneuver forces, they normally arrive as a pure unit (no task organization), a TF, or a team. These organizations have a specific numbering and naming convention.

    a. *Task Force.* The two definitions of a TF are that one is based on the mission and the other, on organization. The one referred to in this manual is a battalion-size unit of armor or infantry to which one or more company-size units of the other combat arm has been attached or is under OPCON.

    b. *Team.* At the company level, a temporary grouping of units is called a team. The same rules apply for its formation as for the formation of a TF, except that platoons are the basic building blocks rather than companies.

    c. *Designations.*

        (1) TFs and teams may be designated as follows:
- Name of the commander—Task Force Williams.
- Use of code name—Team COBRA.
- Use of numeral—Team 1.
- Use of letter—Task Force ALPHA (Team BRAVO).
- Use of unit designation—TF 2-11.
- Use of branch— Team Mech (TF Tank).

        (2) Attached or supporting companies may be renamed to avoid confusion. For example, if the TF has retained its Company A, and another Company A is attached, the attached company could be renamed Company Mech (Tank).

A-15. COMMAND AND CONTROL

    a. The aviation brigade should collocate the attached ground maneuver force's MAIN command post (CP) with the brigade's tactical operations center (TOC). Tactical air coordinator (TAC) CPs can be collocated to make a smooth passage and transfer of the responsibility of zone or sector easier. For missions requiring tight coordination between air and ground elements, the aviation brigade TAC could contain—

        (1) The fire support element (FSE), the ground liaison officer (LO), and the attack battalion LO or S3.

        (2) The ground LO.

        (3) The attack battalion LO or S3.

    b. The ground maneuver force is designated for attachment to, or placement under the OPCON of, the aviation brigade. When this occurs, effective time must be published to

bring about the command relationship. This specified time allows both units to set priorities on which units move and when they move. This measure precludes confusion and congestion. The aviation brigade should coordinate with, and complete, the following with the ground battalion(s)—

(1) Exchange of intelligence, tactical plans, and recognition signals.

(2) Exchange of standing operating procedures (SOPs).

(3) Security measures during movement of the ground unit.

(4) Priorities for use of routes and facilities and provisions for movement control.

(5) FS and other combat support (CS) to be provided by the aviation brigade.

(6) Combat service support (CSS) to be provided by the aviation brigade and the ground unit's parent brigade.

(7) Exchange of liaison personnel.

(8) Collection and exchange of information on friendly minefields and other obstacles.

(9) Command and support relationship between incoming CS and CSS units and facilities and the aviation brigade.

(10) Measures to minimize vulnerability to enemy nuclear, biological, or chemical (NBC) munitions, as well as indirect fire.

c. Both the aviation brigade and the ground maneuver unit may be assigned to the same division. If so, the division commander, through the G3, likely will direct the time of the attachment and the actions that must occur to facilitate the attachment.

d. To facilitate the transfer of control, one technique used is to establish a battle handover line (BHL) for the ground force. The BHL—an established point in the battlespace—is a control measure to conduct a smooth exchange of battle responsibility. It is a phase line in which the aviation brigade assumes control of the ground force once its movement begins. The BHL may be dictated by division; it is located to permit the aviation brigade the ability to continue engaging the enemy and assuming control of the ground force.

e. The attached ground force may be required to move a long distance as part of the aviation brigade plan. If so, the ground force must have priority on clearly identified routes through the parent brigade's area. When possible, routes dedicated for the passing unit's use should be different from parent brigade supply routes. This avoids congestion and confusion; for example, moving light infantry in trucks from a defense to the brigade rear. Once clear of the parent brigade, the ground unit—based on the division or corps movement plan—may be allowed to move quickly on main supply routes (MSRs) to close in the aviation brigade's assigned location. Based on the command relationship, the parent brigade may provide CSS assistance to the force: vehicle recovery, medical evacuation, and emergency repair and refuel of equipment.

A-16. LIAISON OFFICER OPERATIONS

a. Habitually exercise and properly resource liaison officers (LOs). By doing so, the aviation brigade is more apt to receive timely and appropriate information from the attached ground unit. This should result in more planning time and a better understanding of how the ground commander sees the battle developing. This is critical if there is no habitual relationship between the aviation brigade and the attached unit before starting combined operations.

b. For successful LO operations, it is advisable not to send newly assigned second lieutenants (2LTs) or warrant officers (WO1s). These officers have the best of intentions; normally, however, they lack the experience to make significant contributions to the unit. This shortfall is not due to lack of effort. The LOs should not be used as couriers for orders and graphics.

c. The commander must clearly define the specific duties and responsibilities of the LO. This includes LOs from subordinate aviation brigade units, the attached ground unit, as well as the aviation brigade headquarters. The more critical duties and responsibilities include—

    (1) *Before departure from assigned unit.*

        (a) Clearly understand the mission and duties of the LO.

        (b) Know the current situation of your assigned unit. This includes, but is not limited to, concept of operations, unit locations, combat power status, and status of critical supplies.

        (c) Possess current graphics.

        (d) Obtain information and liaison requirements from each staff section.

        (e) Obtain and understand the commander's critical information requirements (CCIRs).

    (2) *Upon arrival at supported headquarters.*

        (a) Report to commander or executive officer (XO); be prepared to brief unit situation.

        (b) Establish communications with assigned unit.

        (c) Visit each staff section and exchange information as required.

    (3) *During liaison tour.* Take the time to clearly define what you expect of your LO. Use the list below as a starting point. The list you develop may be quite different based on individual capabilities and unit requirements. Keep abreast of the situation of the assigned unit; provide updates to supported headquarters. Monitor and assist in the planning process of supported unit as follows:

        (a) Advise staff on how to best employ assets of the assigned unit. This is

especially critical for cross-attachments from 'heavy to light' or 'light to heavy' organizations.

(b) Record all critical information and pass to assigned unit as soon as possible. Include specified/implied tasks, mission-essential tasks, constraints/limitations, etc. This will later assist your unit in conducting its mission analysis.

(c) Receive and pass all enemy situation reports (SITREPs) and other intelligence products as soon as possible. This is perhaps the most critical role of the LO during the planning process.

(d) Conduct adjacent unit coordination as appropriate.

(4) ***Upon return to assigned headquarters.***

(a) Immediately brief the commander, XO, or S3 on information received.

(b) Exchange information with appropriate staff sections.

(c) Assist the unit in conducting the tactical decision making process (TDMP); be prepared to respond to additional liaison requirements.

d. Keys to success with LOs include—

(1) Do not accept your LO's only serving as a courier.

(2) Identify your LO and begin training him as soon as possible.

(3) Provide your LO with appropriate equipment, such as radios, vehicles, and a global positioning system (GPS).

e. TFs typically have problems developing a fully integrated and synchronized plan in a relatively short amount of time. This is one area in which a trained LO can contribute significantly to a unit. The LO can assist the S2 section in IPB and the S3 with course of action (COA) development and wargaming. The commander must ensure that the LO thoroughly understands the planning process and has access to all aviation brigade intelligence products as soon as they become available.

A-17. MOBILITY/SURVIVABILITY

a. When planning for mobility/survivability—particularly for the attached ground force—the aviation brigade must understand the priority of engineer support and how engineers employ their assets.

b. The priority of engineer effort in the security area normally is given to mobility of the passing units of the covering force; then it is given to countermobility to delay the advance of threat units. The aviation brigade commander determines the priority for engineer support in the main battle area (MBA). He bases the support on mission, enemy, terrain, troops, and time available (METT-T). A trade-off between countermobility and survivability exists because they both use the same limited earthmoving resources.

Obstacles are emplaced in depth to support the aviation brigade commander's scheme; they are integrated into the fire support plan to maximize the effect of friendly fires. Counterattacks may require improvement of mobility corridors to ensure success. Priority of engineer effort in the rear normally is given to mobility. Then it is given to survivability for command, control, and communications (C^3), reserve, and CSS assets.

c. Defensive operations require intensive management of engineer resources allocated to support the aviation brigade plan. The resources usually consist of a combination of divisional and corps engineer units. Upon attachment of the ground force, the aviation brigade should request an engineer LO if one is not already provided. The aviation brigade engineer LO and the aviation brigade S4 coordinate early; they forecast and request the large quantities of required Classes IV and V materials and munitions.

A-18. FIRE SUPPORT

a. *Integration of Fire Support*. FS is the collective employment of field artillery (FA), mortars, tactical aircraft, and naval gunfire (NGF) in support of a battle plan. The aviation brigade commander must—

(1) Integrate all FS and maneuver assets to maximize combat power for the combined arms team.

(2) Visualize how he will use his FS resources, which subordinate echelon he will weight with FS, and what targets to attack. He visualizes these actions as he develops his battle plan to employ maneuver forces. This helps him establish priorities for engaging targets and allocating fires.

(3) Ensure the FS plan enhances the maneuver plan and all available fire support is considered along with the S3.

b. *Fire Support System.*

(1) The FS system provides close support for maneuver forces, counterfires, interdiction, and other fires, as required. These fires range from suppression of antitank guided missiles (ATGMs) to suppression of enemy air defense (SEAD).

(2) Close support fires engage enemy troops, weapons, or positions that are threatening or can threaten the force. These fires are effective in reducing enemy observation, flexibility, and C^2. Close indirect-FS—

(a) Expands battlefield depth.

(b) Erodes enemy forces.

(c) Inflicts damage well beyond direct-fire ranges of the aviation brigades air/ground maneuver units.

(3) Counterfires must be considered in developing a scheme of maneuver. Counterfires attack enemy indirect-fire systems, observation posts, and FA C^2 facilities. These fires are planned and executed for offensive and defensive

operations.

(4) Interdiction fires disrupt, delay, and destroy threat forces that are beyond the line of sight (LOS) and cannot fire their primary weapon systems on friendly forces.

c. *The aviation brigade commander and the fire support coordinator.*

(1) The aviation brigade fire support coordinator (FSCOORD)—

(a) Is the commander of the direct support (DS) FA battalion that supports the aviation brigade.

(b) Is the aviation brigade commander's primary advisor on FS matters.

(c) Maintains a working relationship with the aviation brigade commander and his S3 through the planning and execution phases of an operation.

(d) Is located where he can provide the greatest degree of control over the FS assets available to support the maneuver commander's plan. His primary responsibilities include—

- Establishing and supervising the FSE.
- Planning and coordinating FS on surface targets.
- Supervising preparation of the FS plan and integrating it into the aviation brigade's operation plans and orders.

(2) The aviation brigade commander and his FSCOORD plan the battle together. This planning includes evaluation and determination of—

- Attack guidance.
- Target selection standards.
- Avenues of approach.
- Interdiction opportunities.
- Weapon systems orientation and task organizations.
- Support of objectives or defensive positions.
- Methods of attack or defense.
- Time of attack or counterattack.
- High-payoff targets.
- Designation of target areas of interest.
- Coverage of obstacles.

(3) In some cases, FS considerations may drive the scheme of maneuver. There may be insufficient maneuver assets to make the mission viable. If so, FS may accomplish a portion of the mission without committing the aviation brigade's assigned maneuver forces. The aviation brigade commander and his FSCOORD plan FS as follows:

(a) They determine—through the wargaming process—where the enemy must

be slowed or where enemy positions must be breached for maximum total firepower effects. Tactical areas of interest (TAIs) and named area of interest (NAIs)—developed through the IPB process—are integrated into the scheme of FS.

(b) They prioritize the expected enemy target array. High-payoff targets are identified using IPB products with the guidance provided by target value analysis. Target acquisition assets are directed to locate those high-payoff targets.

(c) They consider all weapons and combat multipliers available to the aviation brigade. The FS element (FSE) continuously coordinates the efforts of the battle staff; ensures that all assets are integrated in the maneuver commander's plan.

(d) They execute concurrent planning upon receipt of a mission, continue development of the course of action, refine the operational concept, and execute the plan to develop combat power.

(4) The FSCOORD—

(a) Participates with the commander, S3, and S2 in planning and execution of the battle.

(b) Plans and coordinates execution of the fire FS plan.

(c) Must plan for displacing his firing batteries to ensure continuous, responsive FS; coordinates with the aviation brigade S3 to manage terrain for his batteries, including those of supporting artillery battalions.

d. *Fire Support Planning.*

(1) FS planning determines how and in what volume fires will be used, what type of targets will be attacked, when, and with what means. When planning fires, the FSCOORD must consider METT-T, the commander's intent, and FS guidance. Planning is enhanced when detailed IPB is conducted to identify high-payoff targets.

(2) The aviation brigade commander's intent determines the specific role that FS will play in the aviation brigade scheme of maneuver. For the aviation brigade, the FSCOORD is critical in developing the Army airspace command and control (A^2C^2) plan. The FSCOORD plans fires and allocates resources as the aviation brigade commander outlines his scheme of maneuver. He must know and fully understand—

(a) When and where the commander wants FS.

(b) What the commander wants in the way of effects, duration, and timing.

(c) The commander's critical targets, target areas, and the target priorities.

(d) How all the unit's combat power will be integrated with the FA.

e. *Execution of Fire Support.*

(1) Execution of the FS plan is a combined arms responsibility. The success of the FS plan depends on how well it is understood by subordinate commanders and fire support officers (FSOs). The FS plan and the aviation brigade OPORD must be rehearsed and specific responsibilities assigned.

(2) The aviation brigade FS execution matrix provides subordinate commanders and FSOs a summary of the plan. The plan ties execution of fire support to specific events and assigns specific responsibility for that execution.

A-19. ENGINEER SUPPORT

a. *Engineer Assets.* Divisional maneuver brigades—infantry and armor—normally are supported by their habitually associated divisional engineer company. This is not always true with the aviation brigade. Along with the order to accept the ground maneuver unit, the division commander must allocate engineer assets to the aviation brigade.

b. *Engineer Section.* The division commander allocates engineer assets according to his overall tactical plan. When the aviation brigade is committed, corps engineer augmentation usually provides the aviation brigade with the equivalent of a battalion or more of engineers. The aviation brigade commander's primary point of contact (POC) for engineer expertise, planning, and coordination is the aviation brigade engineer, if assigned. The aviation brigade engineer section—

(1) Provides the commander continuous planning and supervision of aviation brigade engineer assets.

(2) Operates from the aviation brigade TOC.

(3) Maintains communications with the divisional engineer battalion, assistant division engineer, and engineer assets employed within the aviation brigade sector.

c. *Engineer Plans.* Coordinated engineer planning ensures that engineer combat resources support the elements of the battle plan—the scheme of maneuver, the FS plan, and the CSS plan. Plans for engineer support concurrently with planning for other battle elements.

d. *Engineer Missions.* Engineer missions in the aviation brigade area can be divided into four basic roles as follows:

(1) *Countermobility operations.* Countermobility is obstacle construction. Obstacles are used to decrease enemy mobility without hindering friendly maneuver. In open areas, obstacles extend the amount of time enemy units are exposed to friendly fire.

(2) *Mobility operations.* Mobility operations reduce the effects of existing or reinforcing obstacles. They improve the movement of combined arms forces and

critical supplies. Mobility operations are a part of offensive and defensive operations.

(3) *Survivability operations.* Survivability operations—

(a) Are characterized by the employment of protective measures that decrease the lethality of the enemy's firepower while units fight and maneuver.

(b) Include the use of countersurveillance measures, such as camouflage, deception, smoke, and the construction of protective positions.

(4) *Sustainment engineering operations.*

(a) Engineers perform sustainment engineering tasks to ensure the continuous supply of CS and CSS assets forward.

(b) Sustainment engineering tasks include replacement of tactical bridges, construction and repair of support facilities, and area damage control.

e. *Family of Scatterable Mines (FASCAM).*

(1) The aviation brigade commander has a wide range of FASCAM assets available. Artillery-delivered FASCAM, Army aviation- and Air Force-delivered FASCAM, and engineer-emplaced FASCAM can be integrated into the commander's scheme of maneuver in offensive and defensive operations. Each system has different characteristics in terms of patterns, self-destruct times, and responsiveness. These characteristics must be considered in the planning process. Long self-destruct mines self-destruct in more than 24 hours; short, in less than 24 hours.

(2) FASCAM provides a rapid, responsive obstacle emplacement capability to the aviation brigade. The aviation brigade S3 and aviation brigade engineer plan and coordinate use of FASCAM assets despite the means of delivery. A great deal of planning is required for FASCAM emplacement. FASCAM minefields, like all obstacles, must be tied in with terrain and under observation to be effective. Also mines are not particularly effective in open terrain such as the desert.

(3) The corps commander—

(a) Is the approving authority for the employment of all scatterable mines in the corps area.

(b) Usually delegates this authority to the division commander.

(c) Often retains the authority for emplacement of long self-destruct mines at his level.

(d) Frequently delegates approval authority for short self-destruct mines to the aviation brigade commander.

(4) The aviation brigade commander—

(a) May further delegate short self-destruct mine employment authority down to battalion TF commanders; the division commander must concur.

(b) Must state specifically any delegation of authority to employ scatterable mines specifically in the applicable OPORD; otherwise, the authority is automatically withheld.

(5) The unit emplacing the mines—

(a) Immediately reports the pertinent information required by the most expeditious and secure means.

(b) Sends the report through operations channels to the headquarters authorizing the minefield.

f. *VOLCANO Operations.*

(1) VOLCANO gives the aviation brigade the capability to produce large minefields rapidly. Air VOLCANO can produce two minefields per sortie when mounting the M139 mine dispenser system on the UH-60 Black Hawk platform.

(2) The minefields are about 1,115 meters long and 35 meters wide. The minefields are dispensed with their long axis parallel to the route of flight. The mines may be dispensed from both sides of the UH-60 at the same time. If so, two minefields will be created, separated by a mine-free strip of ground about 70 meters wide. These minefields can be useful partcularly in both the offense and defense to support ground maneuver forces. They slow or restrict the enemy's movement; they force him into areas where he can be attacked. They also can be used in conjunction with overwatching aviation fires to protect withdrawing ground forces and allow them to break contact.

(3) Brigade planners must exercise great care when planning Air VOLCANO missions. These missions should not be planned in enemy observation and fire area; the helicopter is extremely vulnerable when flying at the steady altitude, speed, and path required to emplace the minefield. FM 1-113 contains a detailed description of this system and operational planning guidance.

g. *Logistics Considerations.*

(1) Engineer operations in the aviation brigade area require close coordination among the aviation brigade engineer, aviation brigade staff, and the fire support battalion (FSB) commander for logistics support. The high density of Classes IV and V obstacle material requires early planning; it also requires a coordinated push forward through the brigade support area (BSA). The aviation brigade S4 must forecast mine and barrier materials. The forecast is based on preliminary estimates by the aviation brigade engineer and FA battalion S3.

(2) FASCAM delivery is planned and coordinated between the aviation brigade

engineer and the delivery agency. This holds true whether supporting engineer units, artillery, Air Force, or the aviation brigade's organic aircraft are involved.

(3) Maintenance support for engineer units operating in the aviation brigade area must be closely coordinated among the unit, its own parent unit, and the maintenance support elements in the BSA. The supported unit provides common equipment unit-level maintenance. Engineer equipment maintenance is critical to unit survivability. The fire support battalion (FSB) of the parent ground maneuver brigade provides intermediate DS maintenance to rapidly return the equipment to the fight. The supported unit provides medical support.

SECTION IV. Conducting Tactical Operations

A-20. OFFENSIVE OVERVIEW

a. ***Responsive combined arms forces.*** Combat power in the offense is maximized by organizing responsive combined arms forces. These forces must be able to move rapidly, deliver accurate fire, and maintain continuous communication. Plans must provide flexibility to use any favorable advantage that develops during the attack. When an opportunity for decisive action presents itself, the commander commits all necessary resources. Surprise can be gained by deceiving the enemy's defense. It may be gained also by choosing an unexpected course of action and form of maneuver.

b. ***Concentrating and synchronizing assets.*** Successful offensive action requires concentration and synchronization of all assets. The aviation brigade—and its attached ground maneuver forces—must be synchronized at the decisive point and time to ensure tactical success. Thus, the aviation brigade mission must be focused on specific objectives. When these objectives are secured, they permit control of the area or make destruction of the enemy force easier. Designating main and supporting attacks and tasks to attacking forces gives them a better understanding of the mission; it clarifies their responsibilities The aviation brigade plan will designate—

(1) The main attack.

(2) The supporting attack (committed forces).

(3) The reserve.

(4) Follow and support forces, if any.

c. ***Main attack.*** By designating a unit to conduct the main effort, the commander identifies his main attack. The main attack is directed to secure the objectives that contribute most to the mission.

d. ***Supporting attack.*** The supporting attack contributes to the success of the main attack by—

(1) Fixing enemy forces to make the main attack easier.

(2) Controlling terrain that facilitates maneuver of the main attack.

(3) Destroying enemy forces that hinder the main attack.

(4) Deceiving the enemy as to the location of the main attack.

(5) Preventing or delaying enemy concentration against the main attack.

e. *Reserves.*

(1) Reserves are constituted for commitment at the decisive time and place to exploit success or to ensure mission accomplishment. They should not be used to reinforce failure.

(2) Reserves provide the commander with the flexibility to deal with unforeseen contingencies. They also add to security, although this is not their primary function. Reserves may consist of maneuver units, CS units, or both. Reserves are specifically used to—

(a) Exploit success by moving to attack an enemy weakness or vulnerability.

(b) Reinforce or maintain momentum by passing through or around units held up by enemy forces.

(c) Defeat enemy counterattacks.

(3) METT-T determines the size of the reserve. In general, the more vague the situation, the larger the reserve. Whenever possible, one-third or more of the available combat power is retained in reserve.

(4) Reserves are positioned to—

(a) Permit rapid movement to points of probable employment.

(b) Weight the main attack by destroying or blocking enemy counters to the main attack.

(c) Provide security to unoccupied terrain within the aviation brigade sector.

(d) Provide maximum protection from hostile observation and fire consistent with mission requirements.

(5) Reserve missions should be detailed enough to provide the reserve force commander a clear understanding of the aviation brigade commander's intent and commitment criteria. Plans are made to reconstitute a reserve as soon as possible after the original reserve is committed. Designating on-order reserve missions to committed units is a recommended technique.

A-21. SYNCHRONIZING OFFENSIVE OPERATIONS

Successful offensive operations require all combat, CS, and CSS elements with the aviation brigade AO to be totally coordinated, integrated, and synchronized. Organizing operating systems in this way occurs vertically from corps and division through aviation brigade to battalion. It also occurs horizontally among the staff sections. Major considerations on integration of systems in offensive operations follow.

a. *Intelligence.*

(1) The aviation brigade commander's guidance to the S2 should contain the commander's priority intelligence requirement (PIR). After coordinating with the S3, additional intelligence requirements may be recommended to the commander during the S2 and staff IPBs.

(2) The aviation brigade S2 must prepare an up-to-date enemy data base during the IPB process. This data base will support offensive operations and answer the commander's PIR. The threat estimate and data base identify specific enemy vulnerabilities and weaknesses. This information assists the aviation brigade commander to properly concentrate his available combat power.

(3) Developing PIRs and IPBs is a continual process throughout the planning and execution of the offensive operation. The aviation brigade intelligence section answers PIRs using a detailed reconnaissance and surveillance plan. The aviation brigade and TF S2s and S3s develop and coordinate the plan. The aviation brigade S2 requests more information and collection assets from the division when the aviation brigade commander's PIR cannot be met by organic aviation brigade assets. The aviation brigade S2 must ensure integration of the PIR into the higher collection plan.

(4) During the operation, the aviation brigade S2 provides the commander continuous updates of enemy activities and anticipated enemy courses of action. His sources include—

(a) Reports from military intelligence (MI) assets.

(b) Eavesdropping of battalion operations and intelligence nets.

(c) Analysis of reported sightings, and situational templates of the enemy.

b. *Fire Support.*

(1) FS can deliver a variety of munitions to support deep, close, and rear operations. FS assets available to the aviation brigade normally are one DS FA battalion and organic battalion mortars. More FS assets may include close air support (CAS); naval gunfire (NGF); and reinforcing, general support (GS); and GS reinforcing FA battalions. Commanders normally allocate more reinforcing and GS reinforcing battalions to augment the fires of the DS FA battalion to the offense than to the defense.

(2) The aviation brigade FSE is the focal point for integrating all fire support for the

aviation brigade. To effectively integrate FS into the operation, the FSCOORD—

> **(a)** Must understand the mission, the commander's intent, and the concept of the operation.
>
> (**b**) Must be involved in the planning process from the outset.
>
> **(c)** Jointly wargames courses of action with the aviation brigade commander and his staff using the products of the IPB and target analysis processes.
>
> **(d)** Produces the FS plans or execution matrix, an attack guidance matrix, and the high-payoff target list (HPTL) after the commander's decision. These tools fully integrate fire FS for the operation by focusing attack and acquisition systems on enemy systems that must be eliminated.
>
> **(e)** Ensures FS assets are properly employed and synchronized.

(3) Specific considerations for employing FS in offensive operations include—

> **(a)** Employing weapon and target acquisition systems well forward to provide continuous in-depth support without untimely moves.
>
> **(b)** Weighing the main attack by assigning priorities of FS to lead elements.
>
> **(c)** Isolating the point of attack.
>
> **(d)** Softening enemy defenses by delivering effective preparatory fires.
>
> **(e)** Suppressing enemy weapon systems to reduce the enemy stand-off capability.
>
> **(f)** Screening maneuver forces adjacent to enemy units.
>
> **(g)** Suppressing bypassed enemy elements to limit their ability to disrupt friendly operations.
>
> **(h)** Interdicting enemy counterattack forces, isolating the defending force, and preventing its reinforcement and resupply.
>
> **(i)** Providing counterfire to—
> - Reduce the enemy's ability to disrupt friendly operations.
> - Limit the enemy's ability to rapidly shift combat power on the battlefield.
>
> **(j)** Supporting rear operations.
>
> **(k)** Supporting SEAD requirements of aviation battalions.

c. *Attached Ground Maneuver Unit.*

(1) Ground maneuver units from other divisional brigades are placed under the OPCON of the aviation brigade commander. The placement is to accomplish a mission or for the duration of an operation. Placement must be in accordance with

the division commander's intent and concept of the operation. These ground units may operate with the cavalry squadron. They may conduct reconnaissance and security operations. They may serve as assault elements and conduct air assault operations with the assault battalion or GSAB. Finally, the units may maneuver as a composite force with the attack battalions against a specified objective.

(2) Ground units under the OPCON of the aviation brigade must be completely integrated into the aviation brigade scheme of maneuver. The IPB process identifies specific potential targets and missions for the ground unit. The ground maneuver commander then gives specific tactical missions to his assets.

(3) Ground units operating with the aviation brigade or in the aviation brigade AO coordinate locations for assembly areas (AA), forward AAs, and arming and refueling points through the depth of the zone with the aviation brigade S3. In offensive operations, these areas are used in sequence as the main body advances.

(4) The parent brigade for logistics support is responsible for ground units placed under the OPCON of the aviation brigade. Efficient distribution of certain critical classes of supply may require coordination with the parent brigade's FSB.

A-22. COMMAND AND CONTROL OF OFFENSIVE OPERATIONS

a. The command group is augmented by other special staff as desired by the commander; it is positioned to see and sense the battle. By being well forward, the commander can feel the tempo of the battle, improve communications, and influence the main effort with his presence. The command group frequently is on the move. It relies on the aviation brigade TOC to maintain communications with higher and flanking units.

b. The TAC CP and the main CP must move frequently during offensive operations. The TAC CP has to perform the C^3I function for the main CP during these relocations. Therefore, the TAC CP may be augmented with more people from the current operations, intelligence, operations support, and fire support sections out of the main CP. The signal section will leapfrog multichannel and FM retransmission systems forward to maintain communications.

c. The main CP will continue to perform its essential current battle coordination; however, the it will weight its effort toward future battle planning. The disruption of frequent displacement has caused much of the command, control, communications, and intelligence (C^3I) structuring for working the current battle to be pushed forward to the TAC CP and command group.

d. The rear CP and FSB or MSB commanders are committed heavily to coordinate and facilitate the pushing of CSS forward through the cluttered battlefield to sustain the attack. The rear CP and FSB commander initially are concerned with sustaining forward units; providing rear area security; clearing main MSRs; evacuating casualties, equipment, and enemy prisoners of war (EPW); and preparing to reestablish CSS base areas forward.

A-23. OVERVIEW OF DEFENSE

a. On nonlinear battlefields, units of the division may be bypassed, penetrated, or encircled. Units may not lose overall defensive integrity. However, a massive penetration that threatens the integrity of the defense in depth cannot be permitted. While risks are unavoidable, the fighting strength of the division and aviation brigade must be conserved; cohesion must be maintained.

b. Defense is based on careful IPB. The aviation brigade commander—

    (1) Plans selective attacks against deep, high-payoff targets to create opportunities for offensive action.

    (2) Uses attached ground forces, fire support, EW, and maneuver in depth to—

        (a) Isolate leading enemy formations.

        (b) Delay, disrupt, and destroy enemy follow-on forces.

    (3) Also may attempt to degrade the enemy's momentum by attacking its follow-on forces, CS, CSS, and C^2 ; this may make it more difficult to employ artillery or reinforce, resupply, and direct its attacking echelons.

c. Deception, operational security (OPSEC), fires, and maneuver against the enemy's flank and rear cause the attacker to dissipate strength; they also use up resources without gaining success. Deep, close, and rear operations are planned to support a coherent battle plan that enables defending forces to defeat isolated segments of the enemy force.

d. The initial purpose of the defense for the aviation brigade is to gain time. This prevents quick enemy successes that would make a synchronized defense by the aviation brigade impossible. Based on his own estimate of the situation and the higher commander's concept, the aviation brigade commander—

    (1) Decides where to concentrate his main defensive effort and where to economize forces.

    (2) Then assigns missions; allocates forces, fires, and other support; and sets priorities for resources to fight a combined arms battle.

e. The aviation brigade commander may elect to defend *forward* or *in depth* based on METT-T. A defense in the forward part of the sector requires early commitment of the main defensive effort. This may be achieved by either an initial forward deployment of forces or by planning counterattacks well forward in the MBA or even forward of the MBA. A defense in depth may be selected when missions are less restrictive, defensive sectors are deep, and key terrain lies deep in the sector. A defense in depth relies on elements in the security force area and forward elements in the MBA. Through these elements, a defense identifies, defines, and controls the depth of the enemy main effort. The flanks of the enemy main effort are counterattacked to isolate and destroy enemy forces in the MBA.

f. In both area or mobile defense, the overall scheme makes the greatest possible use of maneuver and offensive tactics. When the enemy has committed its forces, the defender's chief advantage is the ability to seize the initiative and counterattack over familiar ground. Protected by his own defensive positions, the defender counterattacks to destroy the halted, disorganized enemy.

g. Brigade commanders organize the battlefield for defense by assigning sectors, battle positions, strongpoints—or a combination of all three—to subordinate battalion TFs.

> **(1)** *Sectors*—the least restrictive control measures—give battalion TFs freedom to maneuver and decentralize fire planning. TF commanders have total freedom to position or maneuver within their sector but must prevent penetration of their rear boundary.

> **(2)** *Battle positions* are used when the aviation brigade commander wishes to retain greater control over the maneuver and position of his TFs.

> **(3)** *Strongpoints* are fortified defensive positions. They essentially are antitank nests that cannot be easily overrun or bypassed by tanks; they can be reduced by enemy infantry only with the expenditure of much time and overwhelming forces. A strongpoint is located on a terrain feature critical to the defense or one that must be denied to the enemy. A strongpoint can be used to shape, contain, or fix the attacker. Extensive engineer support is required to establish strongpoints successfully.

h. Depending on their missions, reserve forces are assigned to AAs or battle positions. AAs are used when the plan for the reserve is to move to another area for employment. The reserve is responsible for the security of the AA. Battle positions are designated if the reserve must defend in depth as a contingency mission.

A-24. PLANNING FOR THE DEFENSE

a. *Intent of the Higher Commander.*

> **(1)** The aviation brigade commander must understand thoroughly the corps and division commanders' intents and align brigade operations with the overall mission. The division commander's detailed intent—issued either in writing or orally—depicts the aviation brigade's role in the division battle. In turn, the aviation brigade commander transmits his intent to his subordinates.

> **(2)** The aviation brigade commander should walk the critical portions of the defensive line with his battalion commanders. This may be impossible. If so, his subordinates should complete a thorough backbrief. This ensures that they understand his intent; that they will implement plans in keeping with the overall defensive concept. As a minimum, the aviation brigade commander must consider—

>> **(a)** IPB.

(b) Friendly maneuver unit combat power.

(c) Friendly scheme of maneuver and reserve location.

(d) Vulnerability to enemy nuclear and chemical weapons.

(e) Impact of deep and rear operations.

(f) Use of combat multipliers—fires, obstacles, EW, CAS.

(g) Logistics supportability of each course of action.

(h) The human factor—training, morale, experience of subordinates.

b. *Friendly Maneuver Unit Combat Power.* The aviation brigade commander—

(1) Monitors the current combat power of assigned subordinate maneuver and CS units.

(2) Closely tracks major weapons systems and personnel fill, especially for maintainers, to ensure proper assignment of missions.

c. *Friendly Scheme of Maneuver and Reserve Location.* Using obstacles, maneuver, EW, deception, and FS, the aviation brigade prevents the attacker from focusing its full strength at one time and place on the battlefield. These measures create confusion, dilute the enemy's strength, and prevent the enemy from maintaining the momentum of the attack. The aviation brigade commander's tactical scheme includes plans to counterattack. Once exposed, located segments of the enemy force are identified and attacked. The key to the execution of counterattack operations is the aviation brigade reserve.

d. *The Reserves.*

(1) The aviation brigade commander's most critical decision during the defense is committing reserves. Once committed, the reserve becomes the aviation brigade main effort and receives priority of support. Early in the planning process, the aviation brigade commander decides fundamentally about the size, composition, and mission of the reserve. A major purpose of the reserve is to regain initiative through offensive action. The reserve does this by launching counterattacks, spoiling attacks, and raids against the enemy. Other purposes of the reserve are to—

(a) Block penetrations.

(b) Contain enemy forces that have penetrated.

(c) React to rear area and flank threats.

(d) Relieve depleted units and provide for continuous operations.

(2) The aviation brigade commander—

(a) Should retain about one-third of his combat power in reserve; METT-T may dictate a larger or smaller reserve. The reserve must remain inactive until committed. This protects it from enemy attack and enhances the shock effect when it is committed.

(b) Besides designated reserve forces, immediately reconstitutes a new reserve as soon as the original reserve is committed. This restores his ability to influence the battle with maneuver forces.

(c) Uses decision points developed through the IPB process to trigger execution of contingency plans for the reserve. The reserve makes maximum use of the defensive preparation time to rehearse each contingency plan, in priority. Rehearsals are conducted to the lowest level possible. TAIs are developed to support the reserve when it is committed.

e. *The Reserve and Offensive Action.*

(1) In planning contingencies for offensive actions of the reserve, the aviation brigade commander—

(a) Considers the enemy situation.

(b) Estimates time and distance factors on following enemy echelons based on the IPB process.

(c) Determines which of his units will attack; where they will attack, where they will be positioned after the attack; and what interdiction or deep attack is necessary to isolate the enemy.

(d) Must also consider the time and distance factors required to focus his combat power at the decisive point defeat the desired enemy force. This is particularly true for the attached ground force.

(2) Although he plans for the counterattack, the commander must realize that it is unlikely the action will correspond exactly to expectations. Thus, he answers these basic questions as the situation develops:

(a) Will an attack facilitate the higher commander's intent?

(b) Is an attack feasible or should the reserve be employed to contain enemy success?

(c) When and where should the attack be executed?

(d) In the event of multiple penetrations, which enemy forces should be attacked and which should be blocked or contained?

(e) Is the window of opportunity large enough to complete the counterattack before the closure of the next enemy echelon?

f. *The Reserve and the Spoiling Attack.*

(1) At times, reserves are used in a spoiling attack role to throw the enemy preparations for the attack off stride. Basic considerations for the spoiling attack are—

(a) The spoiling attack delays, disrupts, and destroys the enemy's capability to launch its attack or commit a following echelon.

(b) The objective of the attack is to destroy enemy personnel and equipment, not to secure terrain and other physical objectives.

(c) Spoiling attacks are not conducted if the loss or destruction of the force jeopardizes the ability of the command to accomplish its defensive mission.

(d) Mobility of the force available for the spoiling attack should be equal to—or exceed that of—the enemy force.

(2) Commanders coordinate plans for counterattacks and spoiling attacks using the attack techniques discussed in FM 71-3 and the FM 1-100 series. The spoiling attack has many of the characteristics of a hasty attack, a reconnaissance in force, and raid operations.

g. *Reinforcing with the Reserve.*

(1) The aviation brigade commander may decide that his units cannot counterattack with a reasonable chance of success. In these instances, he may position the reserve to contain or delay the enemy to gain time for the employment of the reserve of the higher echelon.

(2) The reserve is not exclusively responsible for transition from a defensive posture to the offensive. A variety of tactical situations may offer the opportunity for, or even require, defending units to launch hasty or immediate attacks. Such situations include breakout from encirclement, relief of encircled forces, raids and spoiling attacks, and collapse of enemy resistance or unanticipated enemy withdrawal.

(3) As they plan their battle, the aviation brigade commander and his staff consider how combinations of ground units and aviation units will be integrated into the defensive scheme. This planning includes placement of battle positions, routes, and C^2 arrangements. If a ground unit is identified as the reserve, supporting engineer and military police (MP) assets must maintain route trafficability to enable their timely movement throughout the aviation brigade sector. Positioning and moving reinforcements are enhanced by designating the routes. Providing traffic control personnel and guides at contact points to lead reinforcements and brief them on the situation also helps.

A-25. SYNCHRONIZING DEFENSIVE OPERATIONS

The aviation brigade commander must integrate and synchronize all CS assets to maximize combat power for the combined arms team. To effectively focus combat power, the aviation brigade commander designates the aviation brigade main effort. This designation links each

subordinate commander's actions to those around him, providing cohesion and synchronization. As the aviation brigade commander develops his battle plan to employ maneuver forces, he must visualize how he will synchronize his organic units, the attached ground maneuver unit, and other CS assets (FA, AD, EW, NBC, Engr, and CAS) at the decisive time and place on the battlefield.

a. *Ground Maneuver Forces.*

(1) Synchronized employment of organic aviation and ground maneuver forces in the defense begins with coordination between the aviation brigade S3 and the ground unit LO to plan the operations.

(2) The ability of the ground force, light or heavy, to hold ground in the defense makes them an asset to the aviation brigade. This capability allows the aviation brigade to seize and retain the initiative. Ground maneuver units under the OPCON of the aviation brigade can conduct offensive and defensive operations, reconnaissance, and security missions with air operations.

(3) As in offensive operations, ground maneuver units that operate with the aviation brigade or in the aviation brigade area must coordinate continuously for battle positions, AAs, maintenance collection points, and other uses of terrain with the brigade S3.

(4) The parent brigade remains responbile for logistics support of ground units. However, forward support logistics operations are coordinated with the FSB in the parent brigade's BSA.

b. *Intelligence.*

(1) The aviation brigade S2 must focus on IPB to plan for the defense and analyze the close operation to predict and confirm enemy intentions. Before the battle, the aviation brigade commander requires specific information about—

(a) The composition, equipment, strengths, and weaknesses of the advancing enemy force.

(b) The location, direction, and speed of enemy reconnaissance.

(c) The location and activities of the enemy main body and C^3 facilities.

(2) The aviation brigade and battalion S2s and S3s prepare a detailed reconnaissance, counterreconnaissance, and surveillance plan. The purpose of the plan is to prevent the enemy from seeing and reporting the strength, composition, and location of the aviation brigade. The reconnaissance, counterreconnaissance, and surveillance plan is vital to early detection and identifying enemy reconnaissance in the security area.

c. *Fire Support.*

(1) The aviation brigade commander—

(a) Weights the main effort by establishing fire support priorities.

(b) Synchronizes close, deep, and counterfires with maneuver forces to disrupt and weaken the enemy's offensive action and to provide windows of opportunity for friendly offensive action.

(2) The FSCOORD—

(a) Uses the IPB process, full integration of intelligence-gathering resources, and the target value analysis process (TVAP) to focus fire support on the systems vital to the enemy's success.

(b) Focuses his planning effort on—

- Engaging the enemy early to disrupt the cohesion of its attack and reduce its intelligence gathering capability. (As the enemy enters the security area and MBA, FS will continue to reduce enemy intelligence-gathering effort and ability to mass combat power.)
- Supporting rear operations.
- Providing deep fires to delay and disrupt following echelons.
- Screening friendly movements.
- Providing counterfire to limit the enemy's ability to shift combat power rapidly.
- Integrating fires with the aviation brigade obstacle plan.

(3) FA and mortars pre-position ammunition and survey firing positions in advance. Control of FS assets is centralized for defensive operations.

d. *Air Defense.* AD priorities shift to protecting the covering force, FS elements, BSA, and C^2 facilities. Priorities depend on the maneuver unit's ability to use defensive positions for cover and concealment and incorporate other passive defensive measures. Maneuver units are integrated into the counterair plan by engaging appropriate targets within the capabilities of the weapon systems. Collection and early dissemination of air threat information is required to make this system work.

e. *Mobility/Survivability.*

(1) Priority of engineer effort in the security area—

(a) Normally is given to mobility of the passing units of the covering force.

(b) Then is given to countermobility to delay the advance of enemy units.

(2) The aviation brigade commander determines the priority for engineer support in the MBA based on METT-T. A tradeoff between countermobility and survivability exists because they both use the same limited earthmoving resources.

(3) Obstacles are emplaced in depth to support the maneuver commander's scheme; they are integrated into the FS plan to maximize the effect of friendly fires.

(4) Counterattacks may require improving mobility corridors to ensure success. Priority of engineer effort in the rear is given to mobility, then to survivability for C^3, reserve, and CSS assets.

(5) Defensive operations require intensive management of engineer resources allocated to support the aviation brigade plan. The resources usually consist of a combination of divisional and corps engineer units. The aviation brigade engineer and the aviation brigade S4 coordinate early to forecast and request the large quantities of required Classes IV and V materials and munitions. (**NOTE:** Aviation units do not always receive engineer support. The aviation brigade staff must ensure the attached ground force is properly supported by the engineers.)

f. *Nuclear, Biological, and Chemical Defense.*

(1) With the increase in weapons of mass destruction, the aviation brigade commander must plan for possible enemy use of NBC weapons and defense units. This is true despite the region where his unit is deployed. The S3 and chemical section must determine how vulnerable the aviation brigade forces are to these weapons. The commander specifies the degree of risk he is willing to accept. The chemical section may suggest changes to the concept of the operation . This occurs when the concept involves unacceptable risks from enemy weapons.

(2) Brigade NBC reconnaissance operations in the defense—

(a) Normally identify clean areas, battle positions, movement routes, decontamination sites, and contaminated areas that directly affect operations.

(b) Immediately pass this information gathered from the reconnaissance effort to higher, lower, and adjacent units.

(c) Periodically update the information.

g. *Combat Service Support.*

(1) Logistics support to the combined arms team must be coordinated during the planning and execution phases of each defensive operation. The S4 and FSB or MSB commander must understand the aviation brigade commander's tactical intent so that service support priorities can be established and logistics operations planned to ensure the supportability of the defense. All CSS activities must look beyond the defense to support opportunities for maneuver units during the transition to the offense.

(2) The aviation brigade S4 identifies all planned logistics requirements for the ground maneuver force to their parent unit FSB. The FSB TOC evaluates the supportability of the tactical plan. The TOC identifies any shortfalls through a logistics estimate. The aviation brigade commander and S3 use the logistics estimate to evaluate courses of action.

h. *Command and Control of Defensive Operations.*

(1) The aviation brigade commander, with key staff, normally fights the battle from the TAC CP. However, his personal presence may be required at critical points, such as battle handover from security forces or commitment of the reserve.

(2) The C^2 facilities are more static than in the offense; therefore, emphasis must be placed on locating them in hardened areas or protective terrain and reducing electronic signature. The main CP should be located as far to the rear as possible while maintaining reliable communications with the TAC CP and subordinate battalions. The main CP focuses on monitoring progress of the battle, forwarding information and support requests, and coordinating supporting units.

(3) The rear CP anticipates future support requirements; it coordinates with the FSB commander to ensure continuous logistics support to enable friendly units to regain the offensive. Also it focuses on continuity of support for current operations and control of aviation brigade CSS units moving forward from the BSA. The rear CP must continuously monitor the battle and be prepared to immediately assume the role of the main CP, if necessary.

i. *Military Police.* MP support in the defense provides battlefield circulation control and area security missions. Depending on the MP mission, emphasis should be on MSR regulation enforcement, assistance for security forces' passage, information dissemination, and damage control functions.

j. *Communications.* The aviation brigade continues to use organic FM communications as the primary means of C^2; however, wire should be used whenever possible. During defensive operations, the hardening of C^2 and logistics signal locations becomes more critical because the aviation brigade CPs conduct fewer displacements. If METT-T factors prohibit effective use of wire and messenger, site protection can be improved by using proper signal security measures.

A-26. THE AVIATION BRIGADE DEFENSIVE BATTLE

a. *Counterreconnaissance.*

(1) *Counterreconnaissance—*

(a) Is the first part of the defensive battle the aviation brigade must win.

(b) Is an integral part of the aviation brigade security mission.

(c) Consists of active measures designed to detect, fix, and destroy, as well as passive measures designed to conceal, deceive, and confuse enemy reconnaissance elements.

(2) *Enemy reconnaissance.* The focus of the enemy's reconnaissance is to confirm or deny the intentions and dispositions of the forces it is attacking. The aviation brigade must integrate these measures into a detailed reconnaissance and surveillance plan. The plan is designed to prevent the threat from seeing and reporting the strength, composition, and location of the aviation brigade and its

obstacles. The aviation brigade's primary focus in counterreconnaissance is in providing and coordinating intelligence and fire support to help its maneuver units identify, fix, and destroy the enemy reconnaissance forces.

(3) *Monitoring the suspected threat.* During the preparation phase, the aviation brigade S2 and intelligence and electronic warfare support element (IEWSE) continually monitor and track the covering force battle. Their purpose is to update the actual threat reconnaissance situation. Specific PIRs are developed and modified to identify, confirm, or deny the expected threat.

(4) *Aviation brigade S2 responsibilities.* The aviation brigade S2—

> **(a)** Recommends changes to the task organization to accomplish the reconnaissance, surveillance, and counterreconnaissance plan.

> **(b)** Coordinates support from attached, DS, and GS assets, such as ground surveillance radar (GSR), collection and jamming platoons, and FA.

(5) *Aviation brigade S3 responsibilities.* The aviation brigade S3—

> **(a)** Coordinates the counterreconnaissance effort.

> **(b)** Issues specific directions to the aviation brigade's units on which NAIs they must observe.

> **(c)** Lists required patrols, ambush requirements, specific observation posts (OP) locations, GSR sites, and reporting and engagement criteria. This ensures the aviation brigade has an effective, coherent, integrated, and synchronized counterreconnaissance effort.

b. *Deep Operations.* In the defense, deep operations prevent the enemy from concentrating overwhelming combat power. They do so by disrupting the enemy's momentum and destroying the coherence of its attack. Effective employment of FS and EW deep attack assets depends on careful and continuous planning and IPB. To successfully conduct deep operations, the FSO, S3, and S2 address and fully coordinate deep operations during all phases of the defense.

c. *Security Operations.*

> **(1)** The aviation brigade can perform security force operations as part of a division or corps defense plan. Security force operations include cover, guard, and screen as well as counterattack or defend missions. The most comprehensive mission is the covering force.

> **(2)** The fundamental purposes of the covering force in the defense are to—

> > **(a)** Defeat/destroy enemy reconnaissance forces attempting to penetrate through the security force area.

> > **(b)** Force the enemy to deploy and confirm the direction and strength of the

enemy attack toward the main body.

(c) Provide time for the main body to deploy forward and laterally.

(d) Shape the battlefield to enable coordinated transition to the MBA fight.

(e) Destroy enemy forces in the security area within the covering force's capabilities and missions.

(3) To do this, the aviation brigade—

(a) Defends or delays to strip away enemy reconnaissance units, force the enemy to deploy its main body, and cause the enemy to organize an attack against a defending enemy.

(b) Reveals its main effort as the enemy masses for a main attack.

(c) Fights forward of the MBS for as long as possible so that MBA preparations can be completed.

(d) Through its security force, seeks to keep the actual location of the MBA from the enemy. The security area assigned by higher headquarters begins along the expected line of initial contact and extends rearward to the battle handover line (BHL).

(e) Takes up the security force fight from a series of coordinated, mutually supporting battle positions or sectors.

(f) When directed to do so, hands over the battle to main battle area (MBA) forces, then moves committed forces to a designated area, and prepares them for further operations there.

(g) Normally, has its AA well to the rear but in the MBA. There, both air and ground elements can rearm, refuel, and reorganize and prepare to reenter the fight.

d. *Control of the Security Force.* The security force normally is controlled either by the division or by the corps. The level of command used for controlling security forces generally depends on—

(1) The width and depth of the security force area.

(2) The commander's ability to communicate with subordinate units.

(3) The availability of control headquarters.

(4) The number of battalion-size units operating in the security force area.

e. *Security Force Operations.*

(1) The size and composition of the security force depend on the commander's estimate of the situation as influenced by the factors of METT-T. An aviation

brigade—acting as the security force of a division—may consist of the cavalry squadron, an attack helicopter battalion, and one to four tank heavy battalion TFs. The task organization would also include FA, AD, intelligence, and engineer units. In light units, the aviation brigade would accept light infantry task forces; it would maneuver these units in the security area with organic assault aircraft or ground transportation. Added CAS may be allocated to augment the combat power of maneuver forces found in the security area. MBA FA units are positioned forward to support the security area.

(2) When the aviation brigade is assigned a security force mission, subordinate units accomplish their missions as determined by the aviation brigade commander. Security is provided by giving MBA forces time to react and room to maneuver; therefore, depth of the security force area influences the allocation of forces and missions. As time versus distance requirements are compared, more forces are allocated to the security force or more distance is provided in the security force area. As a rule in mechanized battle, the minimum defensive security force area should be at least 20 kms in depth. This area forces the enemy to commit combat support forces before its attack into the MBA. For light forces, the security area can be compressed. Enemy repositioning of artillery and air defense artillery (ADA) provides the essential indicators of the main efforts.

(3) The higher commander's overall plan should call for a security force to orient on an enemy force rather than a specific time requirement. The security force area may be relatively shallow. If it is, the force may be able only to provide early warning of the main attack and strip away the enemy's reconnaissance.

(4) Unobserved, urbanized, or forested terrain is an avenue of enemy movement. This is true unless the security force is provided with forces to cover such approaches. The aviation brigade's air and ground security force must prevent that infiltration.

(5) The entire security force is not necessarily withdrawn automatically when the first enemy units reach the MBA. A staggered withdrawal improves the chances for overall success. Even if portions of the security force have withdrawn on some avenues of approach, remaining security force elements continue to fight and maintain surveillance well forward of the MBA. This disrupts the enemy's coordination and reconnaissance efforts. A staggered withdrawal of the security force can facilitate counterattacks forward of the forward edge of the battle area (FEBA). This is done by providing observation of, and access to, exposed flanks of penetrating enemy forces. In some cases, the security force can be used to attack first-echelon forces in the rear. It can be committed between echelons to isolate leading enemy units.

(6) Combat power brought against enemy forces within the security area aids the defense of the MBA. It destroys the enemy force's combined arms integrity and damages its ability to react once it arrives in the MBA. FS tasks in the security area focus on deceiving the enemy about the location of the MBA; they disrupt the

enemy's center of gravity before the enemy enters the MBA. FS assists in the defeat of the enemy. FS forces the enemy to commit forces in a piecemeal maneuver and without key functional elements. This is done by—

(a) Isolating attacking units with deep fires to limit the enemy's ability to mass combat forces.

(b) Isolating attacking units with offensive EW to prevent the enemy from providing intelligence to follow-on forces and to prevent reinforcement from follow-on forces.

(c) Destroying accompanying AD systems of the attacking regiments in the security area. This improves the capability of attack helicopters and US Air Force (USAF) aircraft to attack the remaining forces in the MBA. Destruction of the AD radars located by intelligence and electronic warfare (IEW) systems denies the enemy the capability to direct its AD systems. Destruction of C^2 facilities reduces the enemy's ability to incorporate and coordinate indirect fire with maneuver.

(d) Destroying engineer assets to reduce mine clearing capability before enemy arrival in the MBA.

(e) Destroying enemy communications systems, enhancing the EW effort against the remaining radio systems in the MBA.

f. *Battle Handover/Passage of Lines.*

(1) MBA brigades assume responsibility for the battle. They do so as security forces begin withdrawal of combat elements across the battle handover line (BHL). The higher commander establishes the BHL. The MBA and security force commanders coordinate the exact location of the BH. They recommend changes to the higher commander. The BHL is reflected graphically as a phase line; it is identified in the proper operation plan (OPLAN), OPORD, or FRAGO. The minimum graphic control measures for a rearward passage of lines also must be depicted. The BHL establishes a boundary between the ground owned by the security force commander and that owned by the MBA commander. The majority of MBA forces normally are positioned between the brigade rear boundary and the FEBA. However, the MBA commander controls the ground forward of the FEBA out to the BHL. He can place security forces, obstacles, and fires in this area to canalize the enemy or to make the withdrawal of security force elements easier. The BHL also marks the location where control of the battle will be passed from the security force to the MBA force. The BHL typically is located 2 kms to 4 kms forward of the FEBA. Here MBA forces can bring direct and observed indirect fires to bear on the enemy to make proper security force activities (such as disengagement, withdrawal, or passage of lines) easier. Specific passage lanes and other details are coordinated between security force and MBA units. When possible, the boundaries of security force units coincide with those of the MBA brigades. The same considerations apply when the brigade provides and controls its own security forces.

(2) The security force retains freedom of maneuver before passage through the BHL; it passes through the MBA forces as quickly as possible, using multiple passage points. GS and GS reinforcing FA units in the security area pass through the passage points before DS, reinforcing, and attached FA units in the security area. Once the GS and GSR units are in position to support the units, the remaining FA units pass through the passage points before maneuver forces. After the battle handover, FA organization for combat and FS responsibilities changes to reflect the organization necessary to support the MBA.

(3) Coordination between the commander in contact and the commander out of contact is critical. Contact must be maintained with the enemy so that he is unaware that a battle handover is occurring. At a minimum, these elements must be coordinated—

    (a) Establishing communications.

    (b) Providing updates on both friendly and enemy situations.

    (c) Coordinating passage.

    (d) Collocating C^2.

    (e) Dispatching representatives to contact points.

    (f) Recognition signals.

    (g) Status of obstacles and routes.

    (h) FS and CSS requirements.

(4) The rearward passage of lines is the most difficult mission for the aviation/ground TF since the timing of the passage is so critical. The TF must break contact with the enemy to avoid taking major losses during the passage. The most ideal time to execute this operation is between echelons of the attacking enemy force. This natural break—when supported by massed artillery fires, smoke, and CAS from both fixed- and rotary-wing forces—can allow the ground units to execute their passage more safely. Contact points normally are set forward of the BHL on easily identifiable terrain to make coordination between the two units easier. The passage points themselves are both concealed from enemy observation, if possible; they are located where the stationary commander desires the passing unit to enter his sector. Ground and aviation units can use the same passage points or separate aviation passage can be designated. Because of aviation's inherent mobility advantage, it is usually advantageous to pass the ground forces first. An overwatching aircraft or a vehicle on the ground can execute control of a separate aviation passage point.

(5) The forward passage of lines is simply executed in reverse. Release points for the attacking unit should be established behind the BHL to allow the attacking unit to deploy before crossing. Attack positions in the stationary units sector should be

coordinated in advance. The TF commander will maintain contact with the enemy force; his XO normally would be the best choice to coordinate the passage with the attacking unit. At no time during this process can contact with the enemy be lost.

g. *Main Battle Area.*

(1) The battle almost always is decided in the MBA. Options for both opponents become less numerous during engagements in the MBA. The aviation brigade adjusts the defensive main effort to defeat the attack based on information received during the security force operations. The defending aviation brigade concentrates the strongest possible forces for decisive action against the enemy main effort and commits them with the greatest possible violence when the enemy acts.

(2) In the MBA, the aviation brigade directs and controls its fight using direct and indirect fires and maneuver against the assaulting enemy. The aviation brigade's organic fighting systems, with ground maneuver forces, USAF air support, EW, combat engineers, AD weapons, naval gunfire, and the DS and reinforcing artillery units must focus on destroying the enemy. The division supports the brigade fight by providing combat, CS, and CSS; directs operations involving forward brigades; and commits the division reserve when necessary. At the same time, the division conducts deep operations, directs the division engineer obstacle effort, and conducts counterfire operations.

(3) Brigade operations emphasize execution of battalion plans within the context of the overall brigade concept and use of individual initiative according to mission orders. A brigade's main focus of effort is identified; CS assets and other battalion plans are tailored to support this effort.

(4) Brigade and battalion commanders—

(a) Plan and reconnoiter their sectors, counterattack objectives, attack routes, and battle positions in depth throughout their operational areas.

(b) Direct the fight by specifying which battle positions or sectors their units will occupy, what units do when they get there (defend, delay, attack, or overwatch), and how FS will be integrated into the fight at each location.

(5) The brigade defends by confronting the enemy with strong combined arms units positioned in the brigade sector. As the enemy attack moves into the defended area, its forces are delayed, contained, separated, and attacked. The brigade uses frontal and flanking fires delivered from well-positioned ground maneuver TFs and attack helicopters; ambushes and employment of reserves against the enemy flanks and rear; and massed fire support. Obstacles are used to slow, canalize, and disrupt the enemy's timetables. Obstacles and fires are critical to fragment enemy mass, degrade trafficability, and confuse enemy command and control by causing the enemy to fight in multiple directions.

(6) The brigade commander's plan often combines the defense of open spaces and choke points. Counterattacks are developed to exploit the separation of enemy

forces that occurs naturally because of the terrain.

(7) Commanders and planners must recognize the likelihood of penetrations in the MBA. When fighting large, mobile forces, the commander may permit a partial penetration as part of the operational concept; he may then counterattack the flank and rear of the penetration. Penetration of the MBA or separation from adjacent units may occur. If so, MBA forces continue to fight within the commander's intent; they protect their own flanks while striking at the enemy's. When possible, they reestablish contact across areas of penetration. The commander rapidly shifts FS to limit the ability of the enemy commander to capitalize on a penetration. Preparation of counterattack plans are integral to the MBA fight.

h. *Rear Operations.* The brigade rear area extends from the forward battalion rear boundaries to the brigade rear boundary. Units in the brigade rear area are responsible for planning defense against Levels I, II, and III enemy threats. Operations against a Level III rear area threat forces a major change in the brigade's mission. The brigade's higher headquarters must provide the flexibility to deal with a Level III threat or accept the responsibility for brigade rear area defense. Rapid response to a rear area threat—particularly Levels II and III threats—is integral to the commander's ability to sustain a viable defense. FS—with its ability to shift on the battlefield faster than other forms of combat power—is key to rear operations.

SECTION V. Logistics Planning

A-27. LOGISTICS FOR GROUND FORCES

a. Units in direct support or under OPCON of the aviation brigade will coordinate resupply of their elements operating forward with the task force, except as noted in the paragraphs below.

(1) The ADA battalion or battery commander coordinates for the TF to resupply ADA units in direct support with some classes of supply. This may be directed in higher headquarters SOPs and usually includes Class I, III, and V, and common item IX.

(2) The aviation brigade provides engineer materials (Classes IV and V) to supporting engineer units. In addition, engineer units under OPCON of the aviation brigade receive Class I, III, V, and IX support to the greatest extent possible. This support is coordinated through or directed by brigade before the OPCON directive becomes effective.

(3) The parent unit S4 or company commander of the supporting element coordinates with the aviation brigade S4 or headquarters and headquarters company (HHC) commander on resupply of the forward elements. Normally, the supporting units' resupply elements assemble in the BSA; they move to the TF field

trains area. The HHC commander then dispatches these resupply elements forward—along with the TF logistics packages (LOGPACs)—to the LRP. At the LRP, the platoon sergeant of the forward supporting element takes control of the resupply element. These resupply elements maintain contact with the combat trains CP while forward in the FS area. If coordinated between the supporting parent unit and the TF, the resupply of these forward elements is directly managed by the TF. The parent unit must provide the additional logistical assets necessary to supplement the aviation brigade's capabilities. It does not matter how support was coordinated. Any element within the TF AO must be either under the aviation brigade commander's control or at least remain in contact with the combat trains CP to avoid interfering with TF maneuver.

b. Trains for the attached maneuver force may be centralized in one location (unit trains), or they may be echeloned in three or more locations (echeloned trains). Unit trains are formed in AAs and during extended tactical marches. Forming unit trains with a centralized rear CP provides ease of coordination and control; it increases the trains' security. The S4 with the assistance of the S1 controls unit trains.

c. The TF CSS assets normally are echeloned into company combat, battalion combat, and battalion field trains. The battalion combat trains are organized to provide immediate critical support for the combat operation. Field trains are normally in the BSA and under the control of the HHC commander. He coordinates with the aviation support battalion (ASB) or rear CP commander for security and positioning.

d. The most forward CSS elements are the company combat trains. A MEDEVAC team (routinely attached to the company) and the company maintenance team for tracked vehicles, when forward, form the company trains. The company first sergeant—

   (1) Positions these elements.

   (2) Tasks the MEDEVAC team.

   (3) Establishes priority of work for the company maintenance team.

e. When operating in echeloned trains, the company supply sergeant usually operates from the field trains. Coordination between the company supply sergeant and the first sergeant is conducted through the combat trains CP to the HHC commander over the A/L net. Face-to-face coordination during logistics package (LOGPAC) operations supplements the coordination.

f. The battalion combat trains include the combat trains CP, medical platoon elements, decontamination assets, all uploaded Class III and V vehicles, elements of the communications platoon, and the nearby unit maintenance collection point (UMCP), with some supporting elements from the FSB. The S4, assisted by the S1, controls the combat trains. Elements of the combat trains operate on the A/L net. When possible, these elements are linked to the combat trains CP by landline.

g. The battalion combat trains should be close enough to the forward line of own troops (FLOT) to be responsive to the forward units, but not within range of enemy direct fire.

The combat trains can expect to move frequently to remain in supporting distance of the combat elements. The following factors govern the positioning of the combat trains:

(1) Communications are required between the combat trains CP, the main CP, the field trains CP, aviation brigade rear CP, and forward units.

(2) Room for dispersion and cover and concealment from both air and ground observation are desired.

(3) The ground must support vehicle traffic.

(4) A suitable helicopter landing site should be nearby.

(5) Routes to logistical release points or to company positions must be available.

(6) Movement into and out of the area must not be restricted.

h. Built-up areas are good locations for trains. They provide cover and concealment for vehicles and shelter that enhances light discipline during maintenance. When built-up areas are used, battalion trains elements should occupy buildings near the edge of the area to preclude being trapped in the center.

i. The BMO sets up and supervises the unit UMCP. The UMCP provides forward maintenance support to the TF. The UMCP normally is located near the battalion combat trains. The UMCP and battalion combat trains may combine to form a base cluster for defense.

j. The field trains usually are in the BSA; the HHC commander controls them. Generally, they include the PAC, the mess sections, the company supply sections, the HHC command post, and the remainder of those elements of the maintenance and support platoons that are not forward.

k. The BSA is that portion of the aviation brigade rear area occupied by the aviation brigade rear CP, the ASB, or aviation CSS assets of the MSB and the TF field trains. CSS assets in the BSA include these elements, as required—

(1) Elements from the ground unit's parent brigade FSB.

(2) Maneuver and CS unit field trains.

(3) Selected corps (corps support command (COSCOM)) and division (division support command (DISCOM)) resources.

A-28. LOGPAC OPERATIONS

a. Logistics packages are the most efficient resupply of forward ground maneuver units. The company supply sergeant—under the supervision of the HHC commander and the support platoon leader—organizes LOGPACs in the field trains. LOGPACs are organized for each company team and separate element in the TF. They are moved forward at least daily for routine resupply. When possible, all LOGPACs are moved forward in a march unit, under the control of the support platoon leader. Special LOGPACs are organized

and dispatched as required by the tactical situation and logistical demands.

b. The ground unit S4 must plan and coordinate LOGPAC operations to ensure that they fully support the commander's tactical plans.

c. Unit SOP establishes the standard LOGPAC. Normally, a company team LOGPAC includes—

> **(1) *Unit supply truck.*** This vehicle contains the Class I requirements based on the ration cycle— normally, one hot meal and two meals ready to eat (MREs) per soldier. The supply truck tows a water trailer and carries some full water cans for direct exchange. In addition, the truck carries any Class II supplies requested by the unit, incoming mail, and other items required by the unit. The truck may also carry replacement personnel.

> **(2) *POL trucks.*** Bulk fuel and packaged POL products are on these vehicles.

> **(3) *Ammunition trucks.*** These vehicles contain a mix of ammunition for the weapons systems of the company team. The unit SOP establishes a standard load; reports and projected demands may require changes to this standard load.

> **(4) *Vehicles carrying additional supplies and replacements***. These vehicles join the LOGPAC as coordinated by the support platoon leader and supply sergeant.

d. LOGPACs for platoon-sized attachments are usually loaded on a single truck. Water and Class III resupply often is accomplished by using 5-gallon cans and pods mounted on trailers.

e. When the company LOGPAC has been formed, it is ready to move forward under the control of the supply sergeant. The support platoon leader normally organizes a convoy for movement of all company LOGPACs under his control; in emergencies, he dispatches unit LOGPACs individually. The convoy may contain additional vehicles, such as a maintenance vehicle with Class IX to move to the UMCP, or an additional ammunition or fuel vehicle for the combat trains. The LOGPACs move along the MSR to a logistics release point (LRP). Here the unit first sergeant or a unit guide takes control of the company LOGPAC.

f. From the LRP, the company first sergeant or guide controls the LOGPAC and conducts resupply. The unit first sergeant informs his supply sergeant of requirements for the next LOGPAC. The supply sergeant collects outgoing mail, personnel, and equipment for movement to the rear. The LOGPAC then follows unit SOP and returns to the LRP or to the field trains.

g. LRP locations are determined by the S4, based on the tactical situation. They should be well forward and easily located. Normally, two to four LRPs are planned. LRPs, as well as the MSR, combat trains, and field trains locations, are included on the operations overlay, if possible. The combat trains CP notifies subordinates and the field trains CP, well in advance, which LRP(s) will be used. The LOGPAC convoy arrival time at the LRP and the length of time it remains normally are established by SOP. The tactical situation

may dictate otherwise. If so, the S4 must determine the time and notify units accordingly. LOGPACs may be scheduled to arrive shortly after arrival at a battle position (BP) or intermediate objective. Subordinates must ensure that the resupply vehicles are returned to the LRP as soon as possible. This allows the vehicles to return to the field trains and begin preparation for the next mission. Class III and V vehicles never sit empty. If the LOGPAC cannot be completed on schedule, the combat trains CP must be notified.

h. At least one senior representative from the combat trains (S4, S1, or senior NCO) should be present at the LRP while it is in effect. He meets with the unit first sergeants and support platoon leader to coordinate logistical requirements. He ensures that the LOGPAC release and return takes place efficiently. A brief meeting is normally held immediately before the first sergeant picks up his LOGPAC. Coordination may include—

(1) Changes in logistical requirements reflecting any last-minute task organization.

(2) Reports on personnel, logistics, and maintenance from the first sergeants.

(3) First-hand updates on the tactical situation and logistical status.

(4) Delivery, receipt, and distribution of unit mail.

i. The company supply sergeant or support platoon leader moves the LOGPAC from the LRP back to the field trains. The supply sergeant and support platoon leader then begin to organize the next LOGPAC.

j. Resupply of the scout and mortar platoons, the main CP, combat trains, and attached support units must be planned and coordinated. The HHC first sergeant coordinates and supervises resupply of these elements. The HHC first sergeant operates near the TF main CP when forward and at the field trains CP upon completion of daily resupply.

(1) The platoon sergeant of these elements or senior NCO at a facility must report his requirements to the HHC first sergeant or to the combat trains CP. The most desirable method of resupply is to form small LOGPACs for these elements, which the platoon sergeant picks up at the LRP in the same way as a company first sergeant. Attachments larger than a platoon must come to the task force with sufficient CSS vehicles to carry their LOGPACs.

(2) In some cases, the HHC first sergeant delivers the LOGPAC to the main CP, combat trains, and scout and mortar platoons. Attachments can receive resupply at one of these locations or as previously coordinated.

(3) Another option is for attachments to be resupplied from a nearby company team LOGPAC. The S4 coordinates this resupply before the LOGPACs are dispatched.

k. While the LOGPACs are the preferred methods of resupply, there will be times when other methods of resupply are required.

(1) *Resupply from the combat trains (emergency resupply).* The combat trains has a limited amount of Class III and V for emergency resupply. The S4 coordinates emergency resupply from the combat trains and then refills or replaces the combat

trains' assets.

(2) *Pre-stocking.* Pre-stocking is placing and concealing supplies on the battlefield. This normally is done during defensive operations when supplies are placed in subsequent battle positions.

(3) *Mobile pre-positioning.* This is similar to pre-stocking except that the supplies remain on the truck, which is positioned forward on the battlefield.

A-29. TRAINS SECURITY

a. CSS elements behind the FLOT form base clusters and must be prepared to defend themselves against guerrillas and partisans, and forces that have broken through or bypassed the defense.

b. The S4 is responsible for trains security when operating in a unit trains configuration. When trains are echeloned, the S4 is responsible for securing the combat trains; the HHC commander is responsible for securing the field trains. If the TF commander collocates his field trains with the BSA, the HHC commander coordinates with the ASB commander and/or the brigade rear CP commander to integrate the TF field trains into the BSA defensive plan. In all trains areas, a perimeter defense is normally planned. Elements in the trains are assigned a specific sector to defend. Mutually supporting positions that dominate likely avenues of approach are selected for vehicles armed with heavy machineguns. Reaction forces and operations are established, based on the unit SOP. To enhance security, an alarm or warning system is arranged. Sector sketches, fire plans, dispersal plans, and obstacle plans should be prepared. Rehearsals are conducted to ensure that all personnel know the part they play in the defensive scheme. The officer in charge (OIC) at each location establishes a shift schedule for operations and security on a 24-hour basis.

A-30. BASE DEFENSE OPERATIONS

a. When developing his overall plan, the aviation brigade commander ensures that the positioning and organization of the BSA supports the rear operation objectives. The ASB commander, Brigade S4, Brigade S1, or a designated alternate is responsible to the aviation brigade commander to secure, position, and operate the BSA. The key planning task is to ensure that there is a plan for rear area security, and units in the FSB are executing that plan.

b. Well-planned and tenacious base defense is the cornerstone of successful rear operations. Base defense operations are enhanced by the extensive use of obstacles, sensors, surveillance devices, and OPs. Supporting units must be prepared to conduct small-unit security operations and defend themselves against all levels of threat. Base defense operations include all actions that units occupying a base take to protect themselves from the enemy. They consist of a combination of passive and active measures including—

(1) MP patrolling and reconnaissance operations

(2) Hardening and dispersal actions.

(3) Cover and concealment.

(4) Deception.

(5) Immediate reaction to enemy threat or attack.

c. Units operating within the BSA are placed under the OPCON of the ASB or rear CP commander for security and positioning within the BSA. All elements operating within the BSA establish radio, wire, or messenger communications with the ASB TOC or rear CP if the brigade has no ASB. The ASB CP and aviation brigade rear CP collocate to facilitate coordination and rear area security.

d. Areas in the rear that are devoid of tactical units or are isolated because of troop disposition should be reconnoitered by MP patrols. Coordination with other divisional and nondivisional assets deployed within the aviation brigade area of operations must occur to ensure overall linkage of rear operations plans. The S3 coordinates patrolling and reporting with the MP unit commander as part of the MP area security mission.

SECTION VI. Stability and Support Operations Planning

This section concentrates on lesson learned as well as general employment guidelines for ground forces employed in stability and support operations (SASO) in the military operations on urbanized terrain (MOUT) environment. The aviation brigade may receive attached or light or heavy forces under its OPCON for operations in urban terrain. The challenge for the aviation brigade commander is proper employment of the ground force with the brigade's organic aviation units.

A-31. MILITARY OPERATIONS ON URBANIZED TERRAIN

a. *Fratricide.* Urban terrain provides high potential for fratricide because of the likelihood of close quarters (high-weapons density), recognition problems, and unfamiliar secondary effects of weapons. During a recent conflict, soldiers employed several ineffective and dangerous techniques to breach various fences, walls, and barred doors. Soldiers used grenades, rifle fire, and even antitank weapons to breach these barriers. They should not be used. Commanders should schedule opportunities to practice live-fire demolition and breaching techniques in realistic situations with actual munitions.

b. *Direct Fire during MOUT Operations.* Direct FS—even from just a block away—is very difficult to control. During a recent conflict, a brigade told mechanized forces providing FS that the light infantry force had cleared a tall hotel building only to the second floor. In fact, the infantry force had cleared to the tenth floor and was fighting a counter-sniper engagement. Seeing this fire and apparently some weapons protruding, the mechanized forces began to suppress. This drew return fire from the friendly light force. To prevent this, the following should occur—

(1) All units must have routine techniques for conspicuously marking cleared rooms, floors, and buildings as they progress through an urban area.

(2) Marking procedures must be automatic, practiced, and discernable at night. Soldiers must be able to understand these procedures with limited preparation time.

(3) During MOUT operations, units should develop a numbering and marking system for all buildings and landmarks to simplify coordination of maneuver and supporting fires.

c. *Use of Underground Sewer Systems.* Many towns have sewage systems or underground passages for electric or telephone cables. Some cities also have underground railways or rivers. It is important for both attacker and defender to be aware of and assess the tactical value of such underground systems. If belligerents have difficulties crossing checkpoints, they may decide to go under it by way of the city's sewer system. This can be a way for belligerents to circumvent checkpoints until the friendly force obtains diagrams or maps of the sewer system. When dealing with underground sewers—

(1) Use engineers to emplace mines, boobytraps, barbed wire, trip flares, or other obstacles to deter use of the sewer system.

(2) If necessary, remove manhole covers, lower lights on wires, and maintain a 24-hour watch over the open holes. Use 20-minute shifts to maintain soldier alertness.

(3) Be prepared to conduct reconnaissance and surveillance of underground facilities.

d. *Clearing Multistory Buildings.* Doctrine dictates that multistory buildings should be cleared from the top down. But in a built-up area of modern cities, rooftops often become death traps because of their exposure to nearby buildings that are taller. As units assemble on a roof before entering a building, they can become easy targets for a sniper firing from another building only a few feet away. When operating in a multistory building—

(1) Treat rooftops as danger areas.

(2) Maintain dispersion and cover while on rooftops. Designate weapon systems to provide covering and suppressive fire, if needed.

(3) Expect the possibility that one sniper might be luring soldiers into the sights of another sniper in a nearby building.

e. *Communications.*

(1) To avoid interference with the communications of host nations, frequencies must be cleared with the host government. Because of this there is a security risk. Direct references to the identity of call signs and codes can compromise security. Any

breach must be reported to the force headquarters. Most peacekeeping forces normally use fixed call signs and frequencies. Remember that this allows the belligerents to monitor and/or jam communications.

(2) In multination operations, each national contingent of the peacekeeping force is responsible for providing its own internal communications systems. Because these systems are for national use only, the nation's native language and radio procedures are used. Normally, one nation will be tasked to furnish communications to the joint force headquarters and common communications equipment to all nations in the force for C^2.

(3) For SASO, deploy with redundant communications assets. Be prepared to provide communication packages to liaison personnel. For peace enforcement operations, be prepared to employ normal US secure communications to protect forces and to control combat operations.

f. *Urban Communications.* Operations in urban areas have shown how easily very high frequency (VHF) radios are screened and their ranges are reduced. As a consequence, radios must be carefully located to maximize their effectiveness. Retrans stations and remoting of antennas to high ground are methods to maximize VHF radios. To ensure high-quality communications—

(1) Operators must use the upper end of the VHF band and high-power switches on radios to improve communications.

(2) Commanders must be prepared to encounter difficulty in establishing and maintaining communication. They must set limited objectives, covering a small area, and plan for the frequent relocating of rebroadcast stations to ensure communications.

(3) Ground and heliborne retrans stations must be used to maintain communications.

(4) If time and the battle situation allow, maximum use should be made of the civilian telephone system, if it is operational.

(5) EW may be used as a major part in the urban environment.

g. *Use of Weapons in Urban Environment.* Within the confines of house-to-house fighting, all infantry weapons are of value if correctly used. However, a knowledge of house construction is necessary to avoid endangering one's self, fellow soldiers, or innocent bystanders. For example, attempting to fire through the ceiling of a room to neutralize the occupants of the floor above or below may be disastrous if the house has concrete floors. Similarly, to throw a fragmentation grenade into a room with wooden or plaster walls is equally self-defeating. Soldiers in peace operations should avoid unnecessary noncombatant casualties and damage to property. If the situation is not life threatening, negotiation, persuasion, and show of force should be used before violence is applied. Below is a discussion of weapons in MOUT.

(1) The sniper rifle can best be used to pick off belligerent leaders or key individuals and to keep armored vehicles buttoned up. Also it can be used effectively in a countersniper role.

(2) Machineguns are the main supporting weapon in urban fighting. About 100 rounds of 7.62 millimeters (mm) can create a hole 1 foot in diameter in a brick wall 20 inches thick. Another 300 rounds can enlarge the hole to 2 feet by shifting the point of aim and firing in a spiral method.

(3) The 60mm mortar is effective in providing smoke; it can be fired low angle against the sides of buildings to achieve a shorter range than would otherwise be possible. The high explosive (HE) round is invaluable for firing over buildings and reaching dug-in belligerents in gardens and similar types of enclosed cover.

(4) The grenade is a basic tool for house and room clearance. The destructive effect is determined by the type of construction in the structure. Grenade launchers also are extremely valuable in urban areas because of the variety of rounds available.

(5) The light antitank weapon (LAW) and antitank (AT)-4 weapons have a primary purpose of disabling or killing lightly armored vehicles. They can be fired through windows or doors to eliminate snipers. High explosive antitank (HEAT) rounds are unsuitable for making entry holes through brick or concrete walls.

(6) Claymore mines are well suited for protective obstacles. They are suited for not only above ground but also on rooftops and in underground facilities such as sewers and subways. They cannot breach wire obstacles such as chain-link fence.

h. *Converting an Urban Structure into a Strongpoint.* Belligerents are likely to convert houses or buildings into a strongpoint. A platoon-size strongpoint will comprise one or two sturdy buildings with basements or semi-basements. These are usually located at crossroads, on street corners, or overlooking a bridge or open ground such as parks and squares. The aim is to maximize fields of fire and to provide multitiered layers of fire. The basic building blocks of a strongpoint defense are—

(1) Adapt the building for multilayered fire. Most weapons, including antitank and medium machineguns, will be on the ground floor and in the semi-basement. Snipers and automatic riflemen (with grenades and rocket propelled grenades (RPGs)) will fire from upper stories. Attics can be used for mortar positions and for AD weapons (heavy machineguns and hand-held surface-to-air-missile systems (SAMSs)).

(2) Block doors and windows with sandbags, bricks, or earth-filled furniture. Fire from openings created in the sandbags or cut through walls. Create false openings to draw fire; cover real ones when not in usewith suitably painted plywood.

(3) Reinforce floors and firing positions to reduce the effects of collapse as a result of shell fire. Cover floors with up to 1.5 meters of earth or two layers of sandbags.

(4) Remove stairways to complicate enemy clearing. Use ladders for Internal movement between floors. Outside fire escapes should be blocked with wire or booby traps.

(5) To reduce the effect of flame attack, remove combustible materials or cover them with earth. Shields can be placed in front of openings. Underground shelters should have 15 to 20 centimeter-high walls of earth in front of their entrances to stop napalm.

(6) Make basements, storerooms, medical points, and command posts into shelters against bombardment. Every underground facility must have at least two exits. The exits should go in different directions; at least one should be in the form of a covered connecting passage whose exit is beyond the possible distance of collapsing rubble (i.e., two thirds the height of the nearest building).

(7) Give ground floor exits blast-proof protection and have them lead to a communications trench.

A-32. CONDUCT OF STABILITY AND SUPPORT OPERATIONS

a. *Mission Focus.* The severity of human suffering during a recent deployment by US forces caused commanders to try to alleviate the situation on their own. Units were deployed to the field to provide security for the humanitarian relief agency convoys of food. Some local commanders saw the appalling conditions; they realized they were not tasked to give food or provide direct support to the population. Therefore, they took it upon themselves to try to arrange for or speed up relief supplies. While well-intentioned, this activity diverted the commanders' attention from their primary mission; it tended to upset the Humanitarian Relief Organizations' (HROs') planning to prioritize and distribute relief supplies. Commanders should remember the following lessons during these operations:

(1) While well-meaning, commanders must focus on the primary mission; they must not be distracted by missions that correctly belong to the HROs.

(2) Assisting the HROs in their efforts—not usurping the HROs mission—is the best way commanders can perform their mission and assuage their conscience.

(3) Soldiers of all ranks and responsibilities, as well as the suffering population, should be reminded of their obligation to accomplish the mission, and where the dividing line falls.

b. *Peacekeeping Patrols.*

(1) Units will have to conduct patrols during peacekeeping operations. Peacekeeping patrols perform a dual mission of showing the flag and monitoring any agreements. The patrols may move on foot, be mounted in vehicles or in light aircraft or utility helicopters. Peacekeeping patrols normally will be only overt and conducted during the day. When planning for peacekeeping patrol, remember—

(a) Peacekeeping patrols are totally different from normal combat patrols.

(b) The mere presence of a peacekeeping patrol, or the likelihood that one may appear at any moment, deters potential violations of peace agreements.

(c) The presence of peacekeeping troops in a tense situation may have a reassuring and calming effect in troubled areas. If it is necessary to operate at night, the patrol will use lights, carry an illuminated peacekeeping flag, and move in as openly as possible.

(2) Major considerations for peacekeeping patrols include—

(a) Patrols must be easily recognizable by all belligerents.

(b) The peacekeepers flag must be carried by all dismounted patrols and displayed on all vehicles used during mounted patrols.

(c) Patrols should not deviate from the planned route without contacting higher headquarters.

(d) Expect to be challenged by belligerent forces while on patrol. Rehearse proper responses to challenges.

(e) Ensure that maps carried on patrol are unmarked. Memorize positions. Each patrol should always include a member who knows the area well.

(f) Log all observations and events while on patrol. Memorize details for sketch maps. Do not mark on maps if there is the smallest chance of being stopped by one of the belligerents.

(g) Do not surrender weapons, maps, logs, or radios without the permission of higher headquarters.

(h) Upon return from patrol, immediately report any significant observations to the debriefing officer. Mark maps and draw sketches while the memory is fresh. These maps and logs provide the basis for the investigation of incidents and the lodgement of protest.

(i) The unit S2 or intelligence officer must be assimilated intimately into the peacekeeping patrol process.

c. *Peace Enforcement Patrols.* Peace enforcement patrols can be either overt or covert. The normal principles of combat patrolling apply to peace enforcement patrols. Combat patrols also can serve the same purpose as peacekeeping patrols, but the soldiers are not hindered by the administrative restrictions on vehicle marking and weapons restrictions. Based on the situation, the commander must determine whether patrols conducted by peace enforcers should follow the overt methods of peacekeepers. Given the peaceful intent of peace enforcers, patrols should operate as openly as the situation allows. Force protection, as always, is a major consideration. Units will have to conduct patrols for reconnaissance, surveillance, perimeter security, and to protect airfields. Units

will have to conduct security patrols around airfields to keep SAMs out of range of arriving aircraft. Considerations for these patrols include—

(1) Use the normal combat patrolling techniques and procedures during peace enforcement operations.

(2) Apply aggressive patrolling tactics to deter hostile acts by the belligerent forces.

d. *Negotiation and Mediation.*

(1) Peacekeeping officers may find themselves in the role of negotiator, mediator, and even arbitrator at the point of confrontation. If possible, negotiations on matters affecting both parties should be carried out jointly with the two sides. On occasion, relations between them may be so strained that the peacekeeper has to serve as an intermediary. A peacekeeping negotiator must be firm, fair, and polite if he is to gain and keep the trust of both parties. The negotiator must be amaster of detail, tact, and patience. He must have a sense of proportion, resourcefulness, objectivity, and impartiality. On matters of principle, he must be insistent without being belligerent. He must be careful not to pass the confidences of one side on to the other. If officers become negotiators in a tense situation, they must remember the following lessons:

(a) Negotiations are not always successful. Agreements of all parties may or may not occur.

(b) Remain neutral and do not allow yourself to be used by either belligerent.

(c) Expect some of the belligerents to negotiate in bad faith. They may attempt to twist the issues to prolong negotiations while they continue to violate peace agreements.

(d) Negotiations are time-consuming and often frustrating. However, negotiation reduces unnecessary loss of life and offers the best long-term prospects for a final peaceful settlement. It is vital to remain impartial and courteous at all times.

(2) Some helpful hints for conducting negotiations are as follows:

(a) Familiarize yourself with the problem.

(b) Collect all available evidence.

(c) Determine if the point of issue has been raised before.

(d) Find out what agreements or understandings have a bearing on the problem.

(e) Be certain of the peacekeeping forces policy on the problem.

(3) Prepare for the negotiation:

(a) Select and prepare a meeting place acceptable to both parties.

(b) Obtain adequate interpreters and communications assets.

(c) Secure the meeting area and delegates from attack.

(d) Ensure that a common map edition and scale are used by both sides and the peacekeeping force.

(e) Keep your headquarters informed.

(4) Conduct negotiations:

(a) Remember to exchange customary salutations and courtesies.

(b) Introduce yourself and any advisers. Make sure all the delegates are introduced by name.

(c) Use some introductory small talk to make the delegates feel at ease and to assess their mood.

(d) Allow each side to state his case without interruption and without making any premature judgements or concessions. Make a record of the issues presented by each side.

(e) If one side makes a statement that is known to be incorrect, be prepared to produce evidence or proof to establish the facts.

(f) If there is a peacekeeping force-preferred solution, present it and encourage both sides to accept it.

(g) Be sure to close the meeting by explaining to both sides exactly what has been agreed upon and what action they are expected to take. Be prepared to present this in writing for signatures if necessary.

d. *Fire Support Considerations*. During peace enforcement operations, the primary FS mission is counterfire operations. Counterfire in mountainous terrain has the same basic considerations as any other operation. There are some specific considerations because of the terrain and likely threat. FS considerations for peace enforcement operations are—

(1) Select sites for the firefinder radars that are on prominent terrain. This is necessary to get the screening crest as low as possible. The Firefinder Q-36 radar may need to be placed in a city or town. If so, it may have to be air-lifted onto the top of a building to gain coverage of the surrounding area.

(2) Redundant overlap coverage of firefinder systems may be required. It is difficult to obtain a low and consistent screening crest in mountainous terrain. A too low screening crest drives the search beam into the ground. A too high screening crest allows the belligerents to fire under the beam and avoid detection. The Q-36 system will not accept more than a 30-mil variance in the screening crest. The Firefinder Q-37 radar system will not accept more than a 54-mil variance.

(3) Ensure that firefinder radars in the area do not face one another and radiate at the same time. This causes interference and emissions burnout; it results in equipment failure. If radars need to face one another to accomplish the mission, coordinate to ensure they do not radiate at the same time.

(4) Use digital radar maps to minimize the time required for height correction of the weapon system. Digital maps allow the firefinder systems to initially locate weapon systems to within 250 meters. This allows the operator to make only two or three visual altitude adjustments to accurately locate the weapon system.

(5) Mountainous areas have unique weather conditions that affect ballistics drastically. Wind speed and direction can vary considerably depending on datum plane and which side of the mountain you occupy. Frequent meteorological (MET) messages are essential; the FDO should consider registering to improve accuracy.

(6) Consider angle of fall in each fire mission to determine the best method of engagement and unit to fire. When firing against the opposite slope of a ridge or mountain, the angle of fall can be critical to successful target engagement. When shooting, low-angle, large-range probable errors may be caused by the terrain.

e. *Suppression of Artillery.*

(1) Suppression of artillery used to harass population centers and airfields will be a formidable task during peace enforcement operations. It cannot be suppressed by air power alone. When faced with an air threat and counterbattery threat, belligerents will seek to protect their artillery by exploiting its high mobility (especially the mortars) and using concealment offered by terrain. Weapons may be deployed individually, rather than in batteries. Weapons may re-deploy from one camouflaged position to another after firing a few rounds. Weapons may be located in populated areas such as near schools, hospitals, or other restricted fire areas. This complicates the delivery of counterbattery fire through fear of inflicting civilian casualties and collateral damage.

(2) To deal with such an artillery threat, the force should deploy artillery-locating radars and howitzers, as well as artillery forward observers. These, in turn, will require considerable numbers of infantry to protect them. The forces required to achieve and maintain suppression of belligerent artillery to a distance of 20 km of their target areas could be very substantial; they could impose a logistic burden that would threaten to use up the resources needed for security of any humanitarian relief operations.

(3) The Firefinder Radars (Q36/Q37) are effective in the detection of belligerent indirect fire units. They are positioned in a manner to ensure the immediate detection of units firing on critical facilities such as embassies, headquarters, airfields, and hospitals. The radar's position requires careful coordination with coalition radars and any joint or combined targeting cells.

(4) Techniques for suppressing artillery follow.

(a) Use precision-guided munitions or attack helicopters to conduct counterbattery fire to reduce unnecessary collateral damage.

(b) Deploy artillery with the peace enforcement force. Besides counterbattery fire, artillery can fire illumination and smoke rounds if needed.

(c) Deploy firefinder radars to support suppression of combatant artillery and to document violations of cease fire agreements and fix blame for damage and civilian casualties. This information can be passed to the media (if approved by commander) to give an accurate portrayal of the situation to the world.

f. *Belligerent Air Defense Tactics.* For the most part, belligerents usually rely on passive measures to protect themselves from US or coalition air attacks. Depending on the terrain, they may take advantage of the abundant concealment and camouflage available in forests and mountainous terrain. Since the end of the Cold War, many small factions have access to large numbers of handheld SAMs and light ADA. As the war in Afghanistan showed, clever use of such assets in mountainous terrain can be very effective against a modern air force. ADA guns and SAMs can be deployed along likely avenues of approach to targets. Belligerent patrols with handheld SAMs often try to infiltrate close enough to operational airfields to engage aircraft on landing or during takeoff. The belligerents are often satisfied by causing the peacekeeping force to take a defensive reaction that commits large numbers of soldiers to forming an impenetrable cordon around the airfields.

g. *Aviation Support to Peacekeeping Forces.* Helicopters provide the force with flexible, versatile support. They perform such missions as C^2, transport relief supplies, escort convoys, and transport wounded or injured soldiers. They can also be used as a show of force and for surgical strikes to retaliate for attacks on friendly forces. Recent US experience in stability operations have shown the following tactics, techniques, and procedures (TTPs) to be effective:

(1) The aviation LO should coordinate flight corridors between each cease-fire sector. Expect limitations on the use of flight corridors times such as from 0700 to 1900 each day. Coordination must be made with belligerent military forces and with normal civilian air traffic controllers. Consider linking the flight corridors to the friendly convoy routes. They can be mutually supporting to peacekeeping operations.

(2) The night infrared (IR) archlight mounted on a helicopter should be used to enhance the visibility of soldiers with NVDs. The use of regular white-light searchlights also can enhance night operations depending on the ADA threat.

(3) Navigation is crucial and often difficult. Expect existing navigational aids to be either turned off or destroyed. Fit all aircraft with GPS to assist with navigation.

(4) Helicopters should have the usual indentification friend or foe (IFF) transponder codes for AD and air traffic control (ATC). One of the problems they have is that

nap-of-the-earth (NOE) flying could be construed by ground forces as aggressive. So they may have to fly high, out of range of small arms fire.

(5) C^2 aircraft communications assets will be upgraded based on METT-T. Some systems may work better in mountainous terrain than in desert environments. Consider using INMARSAT, TACSAT, and high frequency (HF) radios.

h. *Mine Warfare Operations*. Recent operations have demonstrated the requirement for accurate prediction, detection, removal, proofing, cleared route marking, and area clearance of landmines during operations other than war. Whenever soldiers enter areas where others have fought, they will encounter large numbers of unexploded ordnance and inevitably operate in unmarked and uncleared mined areas. To reduce the impact on friendly force, consider the following:

(1) Landmines will continue be a significant threat to future force projection operations and stability and support operations. In every major peacekeeping arena from Cambodia to Bosnia, mines and fabricated explosives continue to take a toll on troops and civilians.

(2) Units should train on detection, removal, cleared route marking, proofing and area clearance operations. Develop unit drills for dealing with mines and unexploded ordnance.

(3) Heavy mine-clearing capability—such as mine plows and mine-clearing line charges (MICLICs)—may not be appropriate during SASO, when MSR road surfaces should not be destroyed.

(4) Exploitation of human intelligence (HUMINT) is a good source of information of suspected minefield locations.

(5) Look for signs of mining activities, which include dead animals, craters, blown vehicles, disturbed soil, etc.

(6) Helicopters trying to find a suitable landing zone should consider landing in fields with grazing animals. If the animals move about the field without detonating mines when the helicopter begins its approach, the field should be considered safe for landing.

A-33. USE OF TANKS IN PEACE ENFORCEMENT OPERATIONS

a. Infantry forces are best suited for peace enforcement operations; however armor forces can make significant contributions to the operations when attached to the aviation brigade. Tanks are potent weapons systems when performing traditional functions, but they also make excellent infantry support weapons. Some of their capabilities are—

(1) Antitank and antiarmor.

(2) Intimidation of belligerent forces.

(3) Heavy weapons support to infantry fighting vehicles.

(4) Target acquisition especially at night using thermal sights.

(5) Survivable to mines and light AT weapons.

(6) Provide advanced guard support to convoys.

(7) Provide support during search and attack operations.

(8) Protect infantry against automatic weapons fire.

b. Some advantages to using tanks during peace enforcement operations are—

(1) Armor/Mech can be rapidly emplaced at decisive points throughout sector to support threatened United Nations (UN) forces.

(2) Heavy forces have extremely high visibility; they can deter aggression by belligerent forces (consider firepower demonstrations as a show of force).

c. Some disadvantages of using armor during peace enforcement operations are—

(1) The enemy can focus on, isolate, and destroy armor forces in a piecemeal fashion.

(2) Tanks have limited bunker and building destruction capability.

(3) Tanks and other armored vehicles destroy the secondary roads and MSRs.

(4) The size of armored vehicles often block narrow country roads and can destroy private property during movement (may offset attempts to gain support of local civilians).

d. *Light/Heavy Forces.* There is no pure "heavy" or "light" scenario in peace enforcement operations. The best way to achieve success is to balance the array of tactical capabilities in accordance with METT-T. The combined arms concept requires teamwork, mutual understanding, and the recognition by everyone involved with the critical roles performed by other arms. The success of the mission and the lives of soldiers depends on the ability to understand and synchronize the complexities of the light/heavy force.

e. *Armor Considerations for Built-Up Areas.* There are several difficulties in using tanks in built-up areas. Tanks can provide effective support to infantry operations in built-up areas, but infantry teams must be assigned to protect each tank from short-range antitank weapons. Consider the following during planning:

(1) Mobility is restricted because tanks are confined to roads or streets that often require clearance of debris, and possibly mines.

(2) When possible, tanks should take advantage of parks and gardens that offer the best fields of fire.

(3) Buildings may restrict the full traverse of the turret; therefore, elevation of the

main armament may be insufficient to reach top floors and rooftops. However, the commander's machinegun is not so restricted.

(4) Tanks are particularly vulnerable to short-range antitank weapons. Their crews, if exposed, may become casualties from snipers. Tanks must, therefore, move through builtup areas buttoned up. They must move in short bounds using suppressive fire and be supported by other tanks.

SECTION VII. Brigade Rehearsals

"A poor plan thoroughly rehearsed has a greater chance for success than an excellent plan that is not rehearsed." (George S. Patton, Jr., War As I Knew It, 1947).

A-34. OVERVIEW

a. The aviation brigade commander should conduct rehearsals to ensure understanding and synchronization between the organic brigade aviation units and the attached ground maneuver force.

b. There are many techniques for conducting rehearsals. Whatever the technique chosen, rehearsals help—

(1) Clarify the commander's intent.

(2) Expose flaws or disconnected activities in the plan.

(3) Reinforce the scheme of maneuver.

(4) Focus on actions and decision points critical to accomplishing the mission given the unit's current state of training and expected terrain and weather conditions.

(5) Ensure that subordinate commanders explicitly understand their missions, how their missions relate to each other, and how each mission relates to their commander's plan.

(6) Provide feedback to the senior commander.

c. Rehearsals instill confidence in participants; confidence is crucial. It—

(1) Gives participants faith in their own plan's success as well as in their commander's plan.

(2) Provides subordinate commanders with purpose, direction, and motivation.

(3) Enables leaders to execute missions with speed, flexibility, and audacity.

d. The commander also can use rehearsals to reinforce understanding of the plan by helping subordinates visualize the exact meaning of his intent. Moreover, repetition of

tasks leaves a lasting mental picture of the sequence of key actions within the operation.

e. To effectively and efficiently employ rehearsals, units must use them habitually in training. Units at every echelon must routinely train and practice a variety of rehearsal techniques. Unit SOPs must identify appropriate techniques and standards.

A-35. TYPES OF REHEARSALS

The seven types of rehearsals are as follows: *full, key leader, terrain model, sketch map, map, radio*, and *backbrief.* These seven types range from extensive preparation—in time and resourcing—to minimal preparation. Each takes a decreasing amount of time and resources to prepare and conduct the rehearsal. Each rehearsal technique has different degrees of benefit (the understanding that participants gain). The commander can select the one that strikes the closest balance between the time available and the unit's level of understanding of his concept of operation.

a. *Full Rehearsal.*

(1) Full rehearsal produces the most detailed understanding of the mission. However, it consumes the most time and resources; it involves every soldier and system taking part in the operation. If possible, units should conduct full rehearsal under the same conditions (weather, time of day, terrain, etc.) as the unit will encounter during the actual operation. For example, for range operations, units can conduct a full rehearsal over the actual terrain either in vehicles or in aircraft.

(2) Of all the rehearsal types, full rehearsal is the most difficult to accomplish.

b. *Key Leader Rehearsal.*

(1) This rehearsal takes less time and resources than a full rehearsal, because it involves only the unit's key leaders. During key-leader rehearsal, the commander first decides the level of leader involvement he desires. His selected leaders then rehearse the plan using their assigned tactical vehicles or helicopters while traversing the actual terrain. Terrain requirements are the same as for a full rehearsal; only the number of participants changes. For example, the unit company commanders conduct a rehearsal for their companies at the range complex with the battalion commander.

(2) Because of the reduced number of participants, the key-leader rehearsal usually takes less time. In the training environment, commanders use the tactical exercise without troops (TEWT) technique as one way of conducting a key-leader rehearsal.

c. *Terrain Model Rehearsal.*

(1) This rehearsal takes less time and fewer resources than a key-leader rehearsal. If the modeler constructs the terrain model accurately, this rehearsal technique can significantly help subordinate leaders execute the training according to their commanders' intentions.

(2) When possible, place the terrain model where it overlooks the actual terrain of

the AO. The model's orientation should coincide with the actual orientation of the terrain to help participants orient to the actual area of operations.

(3) The size of the terrain model can vary—from a simple table-top arrangement to a large model on which the participants can walk. A large model helps reinforce participants' perception of relative positions of units on the actual terrain. This rehearsal technique also helps participants visualize the execution of the mission.

(4) To create an accurate terrain model, the modeler (designated by the commander) completes the following steps:

> **(a)** *Step 1.* The modeler first determines the scale. He can easily do this by "walking off" so many steps per km; for example, on a range 6 kms by 2 kms, the modeler could assign one step to 1 km and walk off the scale of his terrain model. The modeler also could use another form of scaled metric measurement, such as centimeters to meters or meters to kms.

> **(b)** *Step 2.* Lay down grid lines on the same scale as on the map the commander uses to plan and control the operation. After establishing grid lines, the modeler can use them as references to measure the size and location of terrain features. This simple step greatly increases the accuracy of the terrain model, keeps terrain features in the proper scale, and reinforces participants' memories as they use their maps during the actual operation.

> **(c)** *Step 3.* The modeler labels all terrain features, phase lines, and objectives with appropriate names as the range OPORD prescribes. The terrain model must depict all of the information shown on the operation overlay. An arrow on the model must depict magnetic north (south in the southern hemisphere).

> **(d)** *Step 4.* The commander or his designated representative assembles the rehearsal participants in front of the terrain model. The commander and each subordinate leader walk through a sequential (either by phase, event, or time), interactive, verbal execution of the operation, including decision points and branch plans.

d. *Sketch Map Rehearsal*.

(1) A sketch rehearsal takes less time and resources than a terrain-model rehearsal. Units can conduct this rehearsal almost anywhere, day or night. The procedures are the same as for a terrain-model rehearsal, except the commander uses a sketch for a model.

(2) Sketches must be large enough for all participants to see as the commander and his staff talk each subordinate leader through a sequential, interactive, verbal execution of the operation.

e. *Map Rehearsal*.

(1) A map rehearsal takes even less time and resources than a sketch map

rehearsal. The unit can conduct a map rehearsal day or night. The procedures are similar to the sketch map rehearsal, except the commander uses a map and operation overlay of the same scale as he used to plan and control the operation. Using the map, the commander and his staff walk each subordinate leader through a sequential, interactive, verbal execution of the operation.

(2) To ensure clarity, the commander should conduct this rehearsal at a vantage point overlooking the terrain of the AO. He can use one of two commonly used map-rehearsal techniques. One has each subordinate leader following the rehearsal on his own map and overlay; the other involves laying the map and overlay horizontally, moving unit symbols across the map as in a wargame to show the planned sequence of action-reaction-counteraction following the range synchronization matrix.

f. *Radio Rehearsal.*

(1) Communications are critical during range operations. The commander may decide to exercise communications links between various facilities (TAC CP, TOC, Rear CP, etc.) using a radio rehearsal.

(2) The commander and his staff conduct radio rehearsals by interactively and verbally executing critical portions of the operation over established communications nets. This is accomplished in a general sequence of events that the range operations order establishes. When used, these rehearsals should include all communications facilities and equipment necessary to conduct that actual portion of the operation. To be effective, all participants must have working communications equipment and a copy of the OPORD and synchronization matrix.

(3) This type of rehearsal generally takes less time and fewer resources than other types of rehearsals (except for the backbrief); however, this may not always be the case at higher command echelons.

g. *Backbrief Rehearsal*.

(1) This type of rehearsal takes the least time and resources. The commander, along with his subordinates, can use it to identify flaws or problems in the operation but to a lesser degree than in other types of rehearsals. Also, this technique allows the commander to clarify his intent early in his subordinates' decision making process. A backbrief is effective when used with another type of rehearsal. The commander can conduct the backbrief day or night, in person, or by radio or landline.

(2) During the backbrief, each subordinate commander briefs the commander on how he intends to accomplish his mission before be issues his OPORD to his respective unit. By briefing and explaining his intent and concept of operation to his higher commander, the higher commander ensures that his subordinate commander's intent is properly nested with that of his own. Flaws or potential problems with the operation may also be revealed at this time.

NOTE: Do not confuse the backbrief with the confirmation brief that the commander uses immediately after he issues an OPORD; he uses the confirmation brief to learn how well a subordinate commander understands the mission, task, or directive he has just been given. In this case, he normally requires subordinate commanders to restate what he wants them to do and why. Typically, the confirmation brief occurs at the conclusion of the orders or OPLAN brief when all subordinate commanders are present. He adjourns the session only when he is confident his subordinates understand their mission—the commander's intent, concept of operation, scheme of maneuver, the time plan, and the type and location of the rehearsal.

A-36. PREPARING FOR A REHEARSAL

a. *Commander's role.* During rehearsals, the commander's role is crucial. He is the driving force in the interactive exchange of action, reaction, and counteraction that cements the plan in his subordinates' minds. He focuses his staff to create the rehearsal conditions that best replicate the future battle. Finally, whether the commander, XO, or S3 conducts the rehearsal, the commander is responsible for the effectiveness of the rehearsal. The commander and staff should begin detailed rehearsal planning when the commander approves a course of action.

b. *Step 1.* The commander selects the rehearsal technique when he issues his guidance. This enables a small portion of the staff to begin to prepare the rehearsal site (selection, security, and construction, as required).

c. *Step 2.* The commander then approves the plan and decides whether to conduct a rehearsal that includes the entire operation or one that covers only critical portions of the operation. Reducing the rehearsal to critical portions saves time but might sacrifice comprehension of the whole plan. Time may be the driving factor of the commander's final decision.

d. *Step 3.* The commander next refines the time plan that the staff prepares for the execution of the mission. The time plan consists of allocating the amount of time available to conduct the training before execution.

e. *Step 4.* The commander and staff develop a short list of action-reaction-counteraction events. They base this short list on their understanding of actions that may occur during the conduct of the operation. This list becomes the script for the rehearsal and guides the commander through major events.

f. *Step 5.* The last step is to conduct the rehearsal. The commander, or his designated representative, plays the role of controller and commander. He orders the action by time or event just as he would during the conduct of the range operation. This rehearsal allows the unit to rehearse each critical action, practice contingencies and branch plans, and verify planning factors. One staff member becomes the recorder for any adjustments to the plan or unresolved questions that the rehearsal produces. As a minimum, he should include every event on his execution matrix.

A-37. CONDUCTING A REHEARSAL

a. Participants can use the following sequential guidelines during rehearsals:

(1) Orient participants to the training aid and the terrain.

(2) Define the standard (that is, what the commander will accept as satisfactory performance for the rehearsal).

(3) Visualize and synchronize the concept of operation. Verbally walk through the concept of operation. Subordinate commanders should interactively verbalize their unit's actions, entering or leaving the discussion at the time they would expect to begin or end their tasks or activities during the operation. This will help the commander assess the adequacy of synchronization.

(4) Focus on the key events and the synchronization required to achieve the mission.

(5) Address any points in the operation where the execution of branches or sequels are likely to occur. This includes critical points where slowdowns will likely occur and influence the operation.

(6) If the standard is not met and time permits, rehearse again.

(7) For feedback, make the necessary changes to the synchronization matrix.

b. *Before Rehearsal.* Once participants assemble at the rehearsal site, the rehearsal leader briefs them and leads the rehearsal. His briefing must include an introduction and overview and an orientation.

c. *Introduction and Overview.*

(1) The rehearsal leader introduces himself and all other participants as appropriate. He then—

(a) Gives an overview of the briefing topics, the rehearsal subjects and sequence, and the time line (specifying the not later than (NLT) ending time).

(b) Explains participation in afteraction report (AAR), how and when they will occur, and how he will incorporate changes into the existing order.

(c) Explains, in detail, restrictions imposed on the force, such as the use of pyrotechnics, weapons firing, or radio transmissions.

(d) Ensures that all participants understand safety precautions and enforces their use.

(e) Emphasizes results and what standards of task execution he expects.

(f) Allows leaders to relate any results of tactical planning or rehearsals they may have already conducted.

(2) If the subordinate unit recommends a change to the existing plan, the commander or the S3 acts on what he recommends before the rehearsal begins (when possible). However, before the rehearsal ends, a decision will resolve the

recommendation.

(3) The rehearsal leader gives an orientation to familiarize participants with the terrain or scale model in use. He also issues supplemental materials, if appropriate. He identifies magnetic north on the terrain model or scaled terrain and points out objects and terrain features representing actual terrain features. He also explains whatever graphic control symbols, obstacles, or FS targets are represented. The rehearsal leader always concludes the orientation with a call for questions.

d. *During Rehearsal.* After the briefing, the rehearsal begins after the rehearsal plan. The commander or S3 observes and critiques all portions of the rehearsal. Critiques center on meeting the commander's intent and coordination between units. The internal execution of tasks within the rehearsal usually is left to the subordinate unit commander's judgment and discretion. Leaders at all levels conduct periodic AARs to ensure that units rehearse tasks to acceptable levels of competence and that substandard performance is not reinforced.

e. *Afteraction Reports.* AARs also provide an opportunity to incorporate lessons learned into the existing plan or into subsequent rehearsals. Subsequent rehearsals may employ additional complexity and realism as time and the commander permit.

f. *After Rehearsal.* After the rehearsal, the commander reassembles participants to conduct an AAR. He reviews lessons learned and makes only the absolute minimum required modifications to the existing plan. (Normally, these changes are effected by issuing a FRAGO).

(1) This meeting also allows the commander to issue instructions or reminders and to reiterate his intent. Subordinate commanders incorporate any changes the commander makes to the existing plan into their units' orders and plans. Such changes are also briefed to any key leader or unit that did not take part in the rehearsal.

(2) Changes to the plan should serve as refinements to that plan; they should not be characteristically radical or significant. Changes that are not critical to the execution of the operation can confuse subordinates and desynchronize the plan and, therefore, should be resisted. Before the rehearsal is ever executed, the plan or order should be developed with at least the basic five paragraphs and necessary overlays issued or published. Publication of all annexes may not yet be completed; however, the details should already be developed.

A-38. TRAINING AIDS KIT, FIELD EXPEDIENTS, AND REHEARSAL DEVICES

a. *Training Aids.* Rehearsal training aids augment participants' imaginations; they help them share the same visualization of the operation. Training aids are especially useful with terrain models. The training aids kit minimizes the scrounging of expedients so participants can direct rehearsal preparation efforts to completing the fourth step of the preparation procedures. This same kit can be used for both tactical and range operations.

b. *Training Aids Kit.* The training aids kit's basic components are the same for light or

heavy units. The components are climate-specific (for example, arctic, desert, jungle, or temperate), because climates have varying effects on certain materials (such as spray paint). The quantities of the kit's components are a function of the size of the model and the number of times the trainer will use the model before he must replenish expendable portions. A kit suitable for a small terrain model (such as a sand table) consists of—

(1) A vehicle's first-aid box painted brown on the outside except for the two locking tabs that are white. White tabs on the kit box enable a user to quickly open and close it in the dark.) The box's interior is also white.

(2) A small-arms repair parts box. This small box fits inside the first-aid kit; it can hold miniature vehicle replicas and map symbology such as—

- AAs.
- Checkpoints.
- CPs.
- Coordinating points.
- Decontamination points.
- Engagement areas.
- Passage points.
- Objectives.
- Unit symbols.

(3) Miniature vehicle replicas, like those used in the Dunn-Kempf simulation (micro armor).

(4) A map protractor to which is attached a brightly colored (orange, red, yellow) thread about 1/2-meter long.

(5) Cotton balls, to simulate smoke.

(6) String (gridlines).

(7) Lacing wire, to simulate wire obstacles.

(8) Tongue depressors, to simulate bridges and breaches.

(9) Pipe cleaners, in assorted colors.

(10) Powdered chalk, in watertight containers such as tubes. The kit must contain blue, red, white, and black (charcoal) chalk.

(11) A pencil sharpener, to grind stick chalk into powder.

c. *Components.* The components of this kit are all available through the supply system or the self service supply center (SSSC). All components will fit into the first-aid box. The first-aid box must be water tight; it must be able to fit into the back pocket of the Alice pack (ruck sack).

d. *Larger Terrain Models.* Larger terrain models require larger training aids than those in the smaller kit. All participants must be able to see and read them. Spray paint replaces chalk, engineer tape replaces string, and a ruck sack or a small, durable box replaces the first-aid box.

e. *Field Expedients.* Rehearsal training-aid kits require augmentation by field expedients. Otherwise, the training aids kit would become too large and troublesome to be of practical use. Like the components of the kit, field expedients represent some feature of the terrain, enemy or friendly disposition, or some type of activity (smoke, minefields, preplanned fines). Field expedients are truly only limited to the imagination of the terrain modeler and rehearsal participants. Some examples include—

- Stones, deadfall branches, leaves, vegetation, and so on.
- Canteens.
- Cans.
- MRE cases.
- Ponchos or the side of a vehicle to be used as a chalk board.
- Vehicle tarps.

f. *Aviation Mission Planning System (AMPS).* The AMPS provides the brigade an automated rehearsal capability. The planner can program his route of flight into the system and fly his route of flight on screen before mission execution.

<div align="center">

Appendix B

Risk Management

</div>

Commanders are responsible for effectively managing risk. They must—

   a. Willingly determine the proper balance that will achieve optimum performance from their command.

   b. Select the best risk–reduction options from those that the staff provides.

   c. Accept or reject residual risk, based on perceived benefits.

B–1. COMMAND RESPONSIBILITIES

   a. *Executive Officer.* The executive officer (XO), as director of the staff, ensures integration of risk management in all aspects of staff planning, directing, coordinating, and controlling to support force protection.

   b. *Staff Officer*. In the risk management process, each staff officer must—

   (1) Recommend appropriate control measures.

   (2) Use risk management to assess his or her functional area.

   (3) Recommend appropriate control measures to reduce or eliminate risk.

   (4) Integrate selected risk control into plans and orders.

   c. *Troop Leaders.* Troop leaders must—

   (1) Review control measures for feasibility.

   (2) Report risk issues beyond their control or authority to their seniors for resolution.

   (3) Recommend changes to improve synchronization of their operations in support of the higher commander's plan.

   (4) Use the risk management process to identify, assess, and control hazards for their mission.

B–2. RISK–ASSESSMENT PROCEDURES

   a. *First Three Steps*. During the planning of risk–assessment procedures, include the first three steps of the five-step risk management process. These steps are as follows:

   (1) Step 1. Identify the major events that are expected to occur during the operation and the hazards associated with all specified and implied tasks. The staff reviews and expands, as appropriate, the list of hazards and major events during the wargame. This procedure helps to ensure that all significant hazards have been identified, and the staff can determine the appropriate force protection measures.

(2) Step 2. Assess hazards. By assessing hazards and evaluating battlefield–framework synchronization, the staff can—

(a) Figure out the level of risk associated with a given hazard.

(b) Decide where and when control measures are appropriate to protect the force.

(3) Step 3. Develop controls, and balance a course of action's (COA's) benefits with its potential risks. The staff must—

(a) Identify hazards and assess risk.

(b) Focus on critical events first.

(c) Eliminate unnecessary risks.

(d) Reduce the amount of mission–essential and prudent risks by applying controls.

(e) Develop control options that synchronize the operations that eliminate or reduce risks.

(f) Recommend options for the commander's decision.

Note: In order of priority, options are to eliminate risks through controls or materiel solutions. Leaders should check for residual effects before carrying out risk–reduction options, visualizing what will happen once they implement the option. Often, reducing one risk can create another which, in turn, could introduce other risks or inhibit the execution of Army operations.

b. *Risk–Assessment Matrices.* Risk–assessment matrices provide a simple analysis method of subdividing an operation into its major operational events to discover areas where the staff might eliminate or reduce risk. The matrix is nearly always more effective than intuitive methods in identifying the extent of risk.

(1) Each unit should develop its own risk–assessment matrix with applicable major operational events similar to the one shown in TC 1–210. Units can use the risk–assessment matrix alone or with other analysis techniques.

(2) When using a risk–assessment matrix, the risk assessor must—

(a) Review each situation to ensure he has evaluated all significant areas of concern, even if the matrix does not include them.

(b) Use the matrix to analyze risk and target areas of concern for risk–reducing techniques.

(c) Review individual areas of concern before recommending options.

c. *METT–T Risk Assessment.* Another technique the risk assessor can use is the mission, enemy, terrain, troops, and time available (METT–T) risk–assessment

procedure. Leaders can subjectively decide the likelihood and extent of accidental loss based on this type of analysis. When using the METT–T format, the risk assessor must—

(1) Determine the mission's complexity and difficulty.

(2) Assess the enemy situation and identify specific hazards.

(3) Consider all aspects of the terrain as well as weather and visibility.

(4) Determine the supervision required and evaluate the experience, training, morale, and endurance of units and their equipment.

(5) Determine the time available for planning and executing the mission.

d. *Fratricide Countermeasures.* The commander's decision and supervision of fratricide countermeasures occur later in tactical decisionmaking (after completing the COA analysis). These important points are the means by which the commander benefits from his staff's work. Steps 4 and 5 are included here to preclude oversight:

(1) Step 4. Decide, implement controls, and integrate specific controls into plans, operation orders (OPORDS), standing operating procedures (SOPs), and rehearsals. Knowledge of controls, from the commander to the individual soldier, is essential for successfully implementing and executing controls.

(2) Step 5. Supervise. The commander must enforce controls. Leaders monitor, follow-up, verify, and correct or modify, as appropriate, controls that the commander imposes on his subordinates. When monitoring operational activities, leaders must—

(a) Avoid administrative intrusions on their subordinates' time.

(b) Go where the risks are and spend time at the heart of the action.

(c) Analyze and think through issues, not just watch.

(d) Work with key personnel to improve operational procedures after the action. (Leaders must not hesitate to assess imminent danger issues on the spot.)

(e) Fix systemic problems that are hindering combat effectiveness.

(f) Capture and distribute lessons learned from mishaps and near misses for future use.

B–3. GENERAL RULES

Leaders also must balance the cost of risks with the value of the desired outcome. They must consider and manage risks in making such decisions using the following three general rules:

a. Never accept an unnecessary risk. The leader who has the authority to accept or reject a risk is responsible for protecting his soldiers from unnecessary risks. If he can eliminate or reduce a risk and still accomplish the mission, the risk is unnecessary.

b. Make risk decisions at the appropriate level. The leader who must answer for an accident is the person who should make the decision to accept or reject the risk. In most cases, he will be a senior officer, but small–unit commanders and first–line leaders might also have to make risk decisions during combat. Therefore, they should learn to make risk decisions during training.

c. Ensure that the benefits of a prudent risk outweigh the possible cost of the risk. Leaders must understand the possible risk and have a clear picture of the benefits to be gained from taking that risk.

Appendix C

Nuclear, Biological, and Chemical Operations

This appendix serves as a planning guide by which commanders and staffs may employ their aviation forces in an nuclear, biological, and chemical (NBC) environment. Aviation forces, typically, may be the first to encounter NBC conditions on the battlefield. Aviation brigades can expect to conduct all or part of their operations in an NBC environment. Therefore, brigade commanders must develop an internal organization that not only will support the unit's mission but also its operations in such an environment. To accomplish the mission, commanders must prepare their soldiers to fight and win in an NBC environment. They must also train their personnel to exploit friendly nuclear strikes once the threat employs NBC weapons.

SECTION I. NBC Threat

C-1. THREAT DOCTRINE AND PREPAREDNESS

a. The NBC threat can exist anywhere, including Third World countries that have an NBC capability. Threat employment doctrine stresses offensive operations; it emphasizes the use nuclear and chemical weapons to win. Threat leaders know these NBC weapons may alter tactics, advance rates, force and power ratios, and logistics. Threat can produce and stockpile NBC weapons; they can employ them with a variety of delivery systems.

b. Threats classify nuclear and chemical weapons as weapons of mass destruction when relating them to troop protective measures. However, they consider chemical weapons as conventional when relating them to employment doctrine. Threats have many options for employing nuclear and chemical weapons. Thus, any future conflict involving threats should be considered likely to include employing NBC weapons.

c. Threats have developed and fielded a large inventory of defensive equipment; they have well-trained chemical personnel. As part of their overall preparedness, threats conduct extensive, realistic training. However, NBC warfare imposes the same constraints on threat soldiers as it does on US soldiers. Individual protective clothing and psychological factors also degrade the performance of both threat and US soldiers in an NBC environment.

C-2. NUCLEAR WARFARE

a. Threats have a wide range of systems that can deliver nuclear weapons. As illustrated in Figure C-1, no area on the battlefield is free from the threat of a nuclear strike. Threats have stated priorities for nuclear strikes. They include the following in the order of priority:

- Enemy nuclear delivery means, aircraft, field artillery, missiles, and rockets.
- Airfields.

- Division and higher level headquarters.
- Defensive positions.
- Reserves and troop concentrations.
- Supply installations, especially nuclear ammunition storage points.
- Command, control, and communication (C^3) systems.
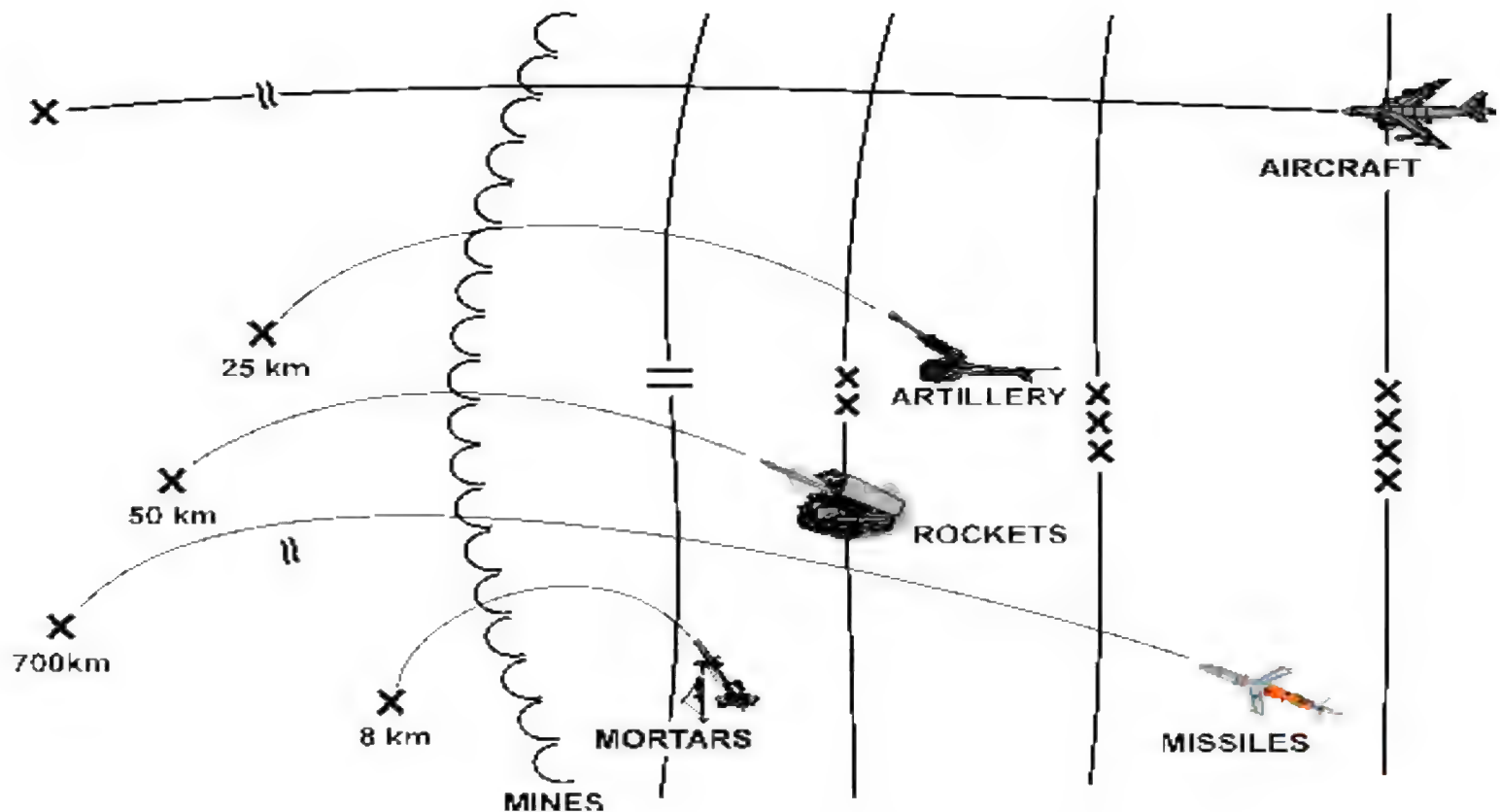
Figure C-1. Range of threat delivery systems

b. Aviation brigade elements are not directly targeted for a nuclear strike. However, the brigade's mission may place elements in an area where they would become a target for nuclear weapons.

C-3. BIOLOGICAL WARFARE

a. Biological warfare is the intentional use of biological agents to cause death or disease in people, animals, or plants. Examples of these living organisms—called germs—such as viruses, bacteria, and fungi. Germs can be dispersed by artillery, rockets, aircraft, sprays, vectors, or covert operations. The possibility of biological warfare exists even though treaties prohibit it. US policy is never to engage in biological warfare.

b. The Army classifies a biological agent as any living organism, toxin, or other agents of biological origin that can incapacitate, seriously injure, or kill personnel. The threat

considers toxins to be chemical agents. The agents covered by biological treaties are bacteriological agents.

C-4. CHEMICAL WARFARE

a. Some threats classify chemical agents in six major types: *nerve, blood, blister, choking, psychochemical,* and *irritant.* The United States classifies chemical agents by physiological effects and/or military use in three major categories: *nerve, incapacitating,* and *riot control.* In a nuclear war, chemicals may be used to complement nuclear weapons. Normally, chemicals would be employed after a nuclear strike when protective equipment has been damaged and personnel are physiologically weak. A combination of agents can be used to complicate medical treatment and compound the effects of individual chemical agents. FM 8-9 describes the effect that agents have on the human body. Chemicals do not require pinpoint targeting because of the potential for contaminating a wide area downwind of the attack.

b. Threat targeting priorities for chemical agent attack are nearly identical to threat priorities for nuclear strikes. Threats may target airfield and rear area lines of communication (LOCs) to disrupt US resupply and reinforcement operations. However, they might keep these points intact for later use by their forces. Threats may target frontline troops—such as reconnaissance or attack forces—with nonpersistent agents. The agents may be delivered by multiple rocket launchers. Threats may also target the flanks with persistent agents to act as obstacles and the intermediate rear area with semipersistent attacks to delay the retrograde of friendly forces.

SECTION II. Nuclear Weapons

C-5. THERMAL RADIATION EFFECTS

The energy released from a nuclear detonation interacts immediately with the surrounding air. Almost instantly with the detonation, an intense light pulse is emitted. Also, the air is heated to thousands of degrees Celsius, vaporizing even the unreacted bomb material. The sphere of super-heated air is called the fireball; the heat and light are referred to as thermal radiation. Thermal radiation will continue to be emitted from the detonation for several seconds to tens of seconds, depending on the yield of the weapon.

a. *Heat Effects.* Heat can affect personnel as well as equipment, supplies, and the environment.

(1) *Skin burns.*

(a) Unprotected or exposed skin is susceptible to thermal radiation burns. These may be first-, second-, or third-degree burns. First-degree burns are similar to a sunburn; they involve injury to the epidermis. In second-degree burns, the epidermal layer is destroyed but some viable tissue remains. These burns usually form blisters. In third-degree burns, the thick epidermis and

underlying layer, or dermis, are destroyed. These burns have a dark brown or charred appearance.

(b) The severity of the burns depends on the yield of the weapon, proximity of personnel to ground zero, and level of individual protection. For example, from a 1-kiloton (kt) explosion, unprotected skin would receive third-degree burns at 600 meters; second-degree burns at 800 meters; and first-degree burns at 1,100 meters. Wearing clothing that does not leave the skin exposed reduces the chance of severe burns. However, the dark color of the battle dress uniform causes it to absorb more thermal radiation; therefore, early warning and defensive measures must begin as soon as a nuclear threat is discovered. Nomex flight suits somewhat protect aircrews from skin burns.

(2) *Materiel damages.* Thermal radiation is hazardous to ground support equipment and supplies as well as personnel. Fuel stored in blivets is especially vulnerable. The black rubber in the blivets will absorb thermal radiation and may become heated and hardened. The blast may also puncture or stress the blivets, causing them to leak. Burning rubber, leaves, or grass might ignite the fuel, causing explosions and fires. Personnel (fuel handlers) at forward arming and refueling points (FARPs) must protect the blivets by burying them or covering them with tarpaulins.

(3) *Fires.* The heat from thermal radiation may cause fire storms in forests and urban areas. These fires may affect aviation units directly if they are in the path of the storm. Fires will affect aviation units indirectly if they are used to evacuate ground units. Ground personnel may be unable to evacuate such areas with their ground transportation assets because of obstacles such as fallen trees.

b. *Light Effects.* Light mainly affects personnel. The effects of light on aircrews range from flash blindness to retinal burns.

(1) *Flash blindness.*

(a) The retina may receive more visible light from a fireball than is needed for light perception but not enough to cause permanent damage. Visual pigments of the photoreceptors bleach out; vision is briefly impaired. This effect is called flash blindness; it is sometimes referred to as dazzle. Flash blindness is more of a hazard at night than during the day, because the pupil is larger and admits more light at night. How flash blindness affects military operations depends on the tasks of affected personnel. While the temporary loss of vision may be hazardous to ground soldiers, it could be fatal for aircrews.

(b) The severity of flash blindness is related directly to the yield of the weapon, distance between the fireball and personnel, and atmospheric conditions. Low visibility will reduce the magnitude of the visible light pulse. In the daytime, a 1-kt weapon could cause flash blindness from a distance of 6 kms. At night, the same weapon would produce flash blindness from a distance of 51 kms.

(2) *Retinal burns*. An excessive amount of light focused on the retina can cause retinal burns. The intense light burns the photoreceptors and causes a blind spot. The damage is permanent, because photoreceptors cannot be replaced. The degree of incapacitation would vary. For example, a person looking directly at the explosion could suffer destruction of the fovea centralis and be considered functionally blind. Another person with a burn in the periphery of the retina might not be aware of the blind spot. Soldiers facing a 1-kt detonation could receive retinal burns from as far away as 6.7 kms.

C-6. BLAST EFFECTS

The rapid expansion of the fireball creates a wave of compressed air. This is referred to as a shock wave or a blast wave. The blast wave causes damage by two kinds of pressure: *dynamic* pressure, referred to as winds; and *static overpressure,* referred to as overpressure. The compressed gases produced by a nuclear explosion expand outward in all directions from the point of detonation. This wave travels at about the speed of sound.

a. *Dynamic Pressure.*

(1) *Wind velocity.* The wind velocity can range from a few miles per hour (m/hr) to hundreds of m/hr. The velocity depends on the yield of the weapon, height of the burst, and distance from the point of detonation. The wind velocity decreases with distance. For example, a 100 m/hr wind occurs about 10 kms from a 1-megaton (Mt) detonation, 6.5 kms from a 300-kt detonation, or 1.5 kms from a 5-kt detonation. However, when a nuclear burst first detonates, the observer is unable to predict the wind force because he does not know the yield of the weapon or the location of ground zero.

(2) *Drag forces.* The winds cause damage by drag forces. Drag forces cause buildings to collapse and vehicles to overturn; they create missiles from flying debris such as rocks, sticks, or glass fragments. They also hurl exposed personnel against structures and solid objects; they blow down trees. For nuclear weapons, the time from the initial blinding flash of light until the blast wave reaches the area can be several seconds or longer. For large-yield weapons at great distances, the time can be longer than 30 seconds. Thus, personnel will have some time to seek shelter before the blast wave hits.

(3) *Wind phases.* Winds have both a positive phase and a negative phase. During the positive phase, winds travel outward from the point of detonation. As the fireball rises, a slight vacuum is created. This will cause the winds to reverse and blow back toward the detonation. The velocities of this reverse wind are mild compared to the positive phase. The reversal of the winds will keep missiles in the air longer and possibly cause more damage. The missiles may fall back to the ground and settle after the positive phase; they are then picked up again by the negative phase. Because of the turmoil, ground troops may not even notice the negative phase. Aircrews may notice it more because wind reversal will create more air instability for them to overcome.

(4) *Aerodynamics.* The effects of high winds on fixed- and rotary-wing aircraft have been studied in wind tunnels and in open-air testing. Nuclear blast winds have the same effects on aerodynamic surfaces and airframes as any other type of high wind. Nuclear weapons can produce enormous wind velocities, extreme turbulence, and wind shear. The winds persist longer than those produced by conventional munitions. Rotary-wing aircraft may experience sudden yaw, pitch, roll, and lift changes. Extreme effects can include blade flapping and bending, mast bumping, loss of tail rotor effectiveness, flameout, and airframe crushing.

b. *Static Overpressure.*

(1) *Overpressure force.* The compressed gases create a force that causes the ambient air pressure to increase; this is overpressure. A conventional high-explosive munition also has an overpressure effect; however, it is not as powerful and lasts only microseconds. The nuclear explosion creates overpressure that can be hundreds of times greater than the ambient air pressure. As with the winds, the overpressure decreases as the distance from the point of detonation increases.

(2) *Aircrew injury.* Wind velocity and overpressure are interrelated. For example, the wind velocity is about 35 miles per hour at 1 pound per square inch (psi) overpressure and about 160 miles per hour at 5 psi. At overpressures of .5 psi and greater, windscreens begin to shatter and flying fragments can injure aircrews. At 35 miles per hour, glass fragments are a significant hazard to the eyes and the throat. At higher pressures, the wind velocity can cause casualties from fragments penetrating the flight suit and skin. Also, with the windscreen gone, external missiles may enter the cockpit and cause injuries. The best protection available to aircrews is receiving an early warning by radio. Thus, the aircrew can land in the lowest terrain possible; they can place the rear of the aircraft in the direction of the expected blast. This method increases the aircrew's survivability. The distance from the blast determines the degree of damage to the aircraft.

(3) *Airframe damage.*

(a) Airframes are vulnerable to overpressure effects. Glass—Plexiglas, safety Plexiglas, or safety glass—begins to shatter at .5 to 1 psi overpressure. At .5 to 2 psi, larger windows that face the point of detonation shatter first. As the overpressure increases (2 to 5 psi), all windows shatter. Overpressure may cause glass to implode initially. Then the positive wind phase creates missiles of the glass fragments.

(b) Overpressure initially affects only the side facing the detonation. However, the blast wave envelops the aircraft within microseconds, exerting forces on the opposite side as well. The sequential occurrence creates buckling and twisting forces, resulting in skin wrinkling and internal frame stresses.

(c) Light damage to the airframe, other than glass, begins to occur at 3 to 5 psi overpressure. On rotary-wing aircraft, the tail boom weakens and may

undergo slight separation. Subsequent severe flight maneuvers may result in tail boom failure. On all aircraft, the fuselage and internal frames undergo substantial stresses and skin panels rupture. Longerons, stringers, and frames may fail at these pressures.

C-7. NUCLEAR RADIATION EFFECTS

Nuclear radiation consists of all types of ionizing electromagnetic and particulate radiation; specifically, alpha, beta, neutron, and gamma. FM 8-9 describes the effects of each type of radiation on the human body. Nuclear radiation travels outward in all directions from the detonation point. The effects of nuclear radiation are categorized as initial and residual.

a. *Initial Effects.* The initial effects are those manifested within 60 seconds after detonation. They consist of all types of electromagnetic and particulate ionizing radiation. For small yields, the initial radiation will cause numerous personnel casualties. However, an aircraft flown close enough to the nuclear detonation for the aircrew to receive incapacitating dosages would probably not survive the blast damage anyway. This initial radiation remains a concern for aircrews on the ground and personnel in FARPs, aviation intermediate maintenance (AVIM) units, and headquarters.

b. *Residual Effects.* The residual effects are those that remain hazardous after 60 seconds. The most important residual effects are fallout and induced radiation or neutron-induced gamma activity.

(1) *Fallout.* The fireball continues to grow after a nuclear detonation, stabilizing within several minutes. Because hot air rises, it also gains altitude as it grows. The rising and cooling of the fireball create an area of low pressure directly beneath the fireball. If the point of detonation is close to the earth's surface, then dirt and debris are drawn up into the fireball. Vaporized bomb material then mixes with the dirt and debris. The mixture of radiological dirt and debris—called fallout—begins to fall back to earth and may cover hundreds of kms as it travels downwind. Fallout can result in significant radiation dose-rate levels and communication blackouts from large quantities of dust and debris in the atmosphere. Large particles may also cause structural damage and foreign object damage (FOD) to aircraft.

(2) *Induced radiation or neutron-induced gamma activity.* Neutron radiation occurs only during the initial nuclear reaction. However, neutrons can cause other elements to become radioactive. The ground directly below the point of detonation will most likely become radioactive. This induced pattern—usually not exceeding 4 kms in diameter—will present a significant radiation hazard for ground personnel for 2 to 5 days after the burst. The extent of the hazard can be determined by reconnaissance or survey teams.

c. *Radiation Exposure and Sickness.* Aircrews exposed to radiation may exhibit certain symptoms. The onset of radiation symptoms, their severity, and their duration generally depend on the amount of radiation the individual receives and variables such as health, previous exposure, and injury. Before directing aircrews into areas of suspected or known radiation contamination, aviation commanders must evaluate the essentiality of the

mission. Aircrews can use radiac meters and dosimeters in aircraft to measure radiation total dose and dose rates. Commanders can then evaluate the effects of aircrew exposure and anticipate aircrew ability to perform future missions. Figure C-2 shows the biological effects of a range of radiation doses. The table also shows the effects of mid-range doses on performance. An individual exposed to radiation may have alternating periods of performance degradation, combat effectiveness, and combat ineffectiveness. For example, an undemanding task in the 500- to 800-cGy range may cause an individual's performance to be degraded initially for up to 2 days; then the individual briefly regains combat effectiveness; thereafter, the individual's performance is again degraded and deteriorates until he becomes combat ineffective.

(1) **Radiation exposure.** Radiation exposure considerations are much the same for aviation personnel as for ground personnel. However, the aviation commander has the more difficult job of determining when an aircrew becomes ineffective from radiation exposure. FM 101-31-1 contains additional information on radiation effects.

(2) **Radiation sickness.** Aviators must be alert to symptoms that impair their ability to fly. Leaders should observe their personnel closely to detect behavior that may necessitate grounding them. Initial symptoms of radiation sickness—such as nausea, fatigue, and listlessness—may mimic those of other illnesses. Flight surgeons should monitor radiation exposure and provide appropriate guidance to the commander.

Table E-1. Expected response to radiation

Free-in-Air Dose Range cGy (rads)	Initial Symptoms	Performance (Mid-Range Dose)	Medical Care and Disposition
0 to 70	From 6 to 12 hrs: none to slight incidence of transient headache and nausea; vomiting in up to 5 percent of personnel in upper part of dose range.	Combat-effective.	No medical care; return to duty.
70 to 150	From 2 to 20 hrs: transient mild nausea and vomiting in 5 to 30 percent of personnel.	Combat-effective.	No medical care; return to duty; no deaths anticipated.

150 to 300	From 2 hrs to 2 days: transient mild to moderate nausea and vomiting in 20 to 70 percent of personnel; mild to moderate fatigability and weakness in 25 to 60 percent of personnel.	DT: PD from 4 hrs until recovery. UT: PD from 6 hrs to 1 day. PD from 6 wks to recovery.	In 3 to 5 wks: medical care for 10 to 50 percent. At low end of range, death may occur for more than 5 percent; at high end, death may occur more than 10 percent; survivors return to duty.
300 to 500	From 2 hours to 3 days: transient moderate nausea and vomiting in 50 to 90 percent of personnel; moderate fatigability in 50 to 90 percent of personnel at high end of range.	DT: PD from 3 hrs until death or recovery. UT: PD from 4 hrs to 2 days. PD from 2 wks until death or recovery.	In 2 to 5 wks: medical care for 20 to 60 percent. At low end of range, death may occur for more than 10 percent; at high end, death may occur for more than 50 percent; survivors return to duty.
500 to 800	Within first hour; moderate to severe nausea, vomiting, fatigability, and weakness in 80 to 100 percent of personnel.	DT: PD from 1 hr to 3 wks. CI from 3 wks until death. UT: PD from 2 hrs to 2 days. PD from 7 days to 4 wks. CI from 4 wks until death.	In 10 days to 5 wks: medical care for 50 to 100 percent. At low end of range, death may occur for more than 50 percent in 6 wks; at high end, death may occur for 90 percent in 3 to 5 wks.

800 t0 3,000	Within first 3 mins; severe nausea, vomiting, fatigability, weakness, dizziness, and disorientation; moderate to severe fluid imbalance and headache.	DT: PD from 45 mins to 3 hrs. CI from 3 hrs to death. UT: PD from 1 to 7 hrs. CI from 7 hrs to 1 day. CI from 1 to 4 days. CI from 4 days until death.	Medical care from 3 minutes until death. 1,000 cGy: 100 percent deaths in 2 to 3 weeks. 3,000 cGy; 100 percent deaths in 5 to 10 days.
3,000 to 8,000	Within first 3 mins; severe nausea, vomiting, fatigability, weakness, dizziness, disorientation, fluid imbalance, headache, and collapse.	DT: CI from 3 to 35 mins. PD from 35 to 70 mins. CI from 70 mins until death. UT: CI from 3 to 20 mins. PD from 20 to 80 mins. Cl from 80 mins until death.	Medical care from 3 minutes until death. 4,500 cGy: 100 percent deaths in 2 to 3 days.
Greater than 8,000	Within first 3 mins: severe and prolonged nausea, vomiting, fatigability, weakness, dizziness, disorientation, fluid imbalance, headache, and collapse.	DT and UT: CI from 3 mins until death.	Medical care needed immediately. 8,000 cGy: 100 percent deaths in 1 day.

LEGEND: CI—combat ineffective (less than 25 percent performance)
DT—demanding task
PD—performance degraded (25 to 75 percent performance)
UT—undemanding task

C-8. ELECTROMAGNETIC PULSE EFFECTS

The electromagnetic pulse (EMP) effects is a wave of electromagnetic energy produced by a nuclear detonation when gamma rays make contact with the atmosphere. The wave occurs immediately after nuclear detonation and travels outward in all directions. EMP presents no significant biomedical hazard to humans. However, it can damage electronic components. Because EMP is a form of electromagnetic energy, it will follow the path of least resistance into electrical equipment.

a. *Component and Aircraft Systems Damage.*

(1) *Component damage.* EMP can affect any electrical component. A sudden surge of EMP will cause overvoltage, shorting out wiring and transistors. Vacuum tubes may be somewhat affected by EMP, but more energy is required to destroy them. EMP can enter through the casing of radios and destroy them. It can destroy circuitry even with radios turned off and antennas disconnected. The severity of the damage depends greatly on component design. Testing continues to determine the extent to which a system can be disabled by EMP damage. Not every electrical component will be destroyed by EMP. Some components may only be temporarily disabled.

(2) *Aircraft systems damage*. Aircrews should know which aircraft electrical systems are critical and how failure of those systems will affect the flight. For example, some aircraft instruments may be disabled, radios or navigational aids may not work, or visual or targeting aids may fail.

b. *Communication Net Impairment.* EMP will affect the nets of the aviation brigade. Because the brigade is highly mobile and dispersed over a wide area, radio is the primary means of communication. Commanders must be prepared for EMP degradation by training with backup units and alternate means of communication. FM 101-31-1 contains additional information on electrical effects.

SECTION III. Biological Agents

C-9. LIVING ORGANISMS

Classical biological agents include those causing the disease of anthrax, plague, smallpox, botulism, and typhoid fever. The agents causing these diseases are living organisms that usually require a host body to mature. Because the effects of these agents are usually delayed, a natural outbreak may be difficult to differentiate from a covert attack. Some agents are highly persistent, while others have a short life span outside the host body.

C-10. TOXINS

Toxins are poisonous chemical substances produced by living organisms. They are found in nature but only in small quantities. Microorganisms, plants, animals, reptiles, and insects produce toxins. By weight, most toxins are thousands of times more toxic than standard chemical agents.

    a. *Common Toxins*. Some commonly known lethal toxins that microorganisms produce are botulism, staphylococcus, and tetanus. Other toxins are produced by poison ivy, snakes, poisonous frogs, bees, spiders, and scorpions. Their toxicity ranges from extremely lethal to simple harassment such as an ant bite.

    b. *Yellow Rain*. Tricothecene toxin is also known as yellow rain. T2—as it is commonly called—is a by-product of the respiration process of an organism that grows on decomposing grains. Individuals exposed to large doses of T2 soon experience an onset of violent itching, vomiting, dizziness, and distorted vision. Within a short time, they vomit blood-tinged material and later larger quantities of blood. The affected individuals die within hours, manifesting shock-like symptoms. Personnel may be exposed to smaller doses directly or indirectly through consumption of contaminated water or food. These individuals experience a slower onset of similar symptoms along with bloody diarrhea. Many die eventually of dehydration. Survivors may take several months to heal.

    c. *Botulism*. Another highly lethal toxin is the by-product produced by clostridium botulinum. This agent causes botulism and is extremely lethal to humans. It is several times more lethal than any of the standard chemical agents.

C-11. EFFECTS

Mild exposures to biological agents can severely degrade performance. Many of the classical diseases have delayed effects, whereas the effects of most toxins are immediate. Toxins can create area contamination as well as downwind and vertical vapor hazards. Medical personnel, especially flight surgeons, must constantly monitor aviation personnel to detect unusual symptoms that may indicate exposure to a biological agent. FM 3-9 and FM 8-9 contain detailed information about the effects of biological agents.

C-12. PROTECTION

Commanders must be prepared to protect against biological agents used by an enemy. The United States has immunization programs for many of these agents to help protect personnel against the diseases.

<div align="center">

SECTION IV. Chemical Agents

</div>

C-13. NERVE AGENTS

    a. *Effects*.

        (1) Even extremely low dosages of nerve agents can disable personnel. The

dosages can degrade the ability of aircrews to operate aircraft and ground personnel to support aviation operations. Nerve agents will severely disable personnel in any occupation requiring dexterity and high-mental function. Nerve agent exposure is cumulative, so repeated exposure to low dosages will result in a cumulative increase in personnel disabilities.

(2) Nerve agents are lethal in either vapor or liquid form; they can be employed as nonpersistent or persistent agents. They cause casualties through any portal of entry: respiratory tract, skin, eyes, or mouth. (They usually are ingested by mouth with contaminated food or water.) After aircrews have flown into a vapor cloud, within one two breaths, they can inhale sufficient agents to cause initial convulsive movements of extremities within 30 seconds; progressively, to collapse and become unconsciousness within 1 minute; and to experience flaccid paralysis, respiratory failure, and die within 2 to 3 minutes. When agents are ingested in contaminated food or water, symptoms may vary or be delayed.

(3) Low dosages of a nerve agent also will cause miosis. Symptoms of miosis are pinpointed pupils, blurred vision, and eye pain. The victim cannot adapt to night vision because the dark adaptation of the rods in the peripheral portion of the retina is restricted. Miosis may last for hours or several days. Full recovery may not occur for weeks. Symptoms of miosis may be evident in the absence of any other nerve agent symptom.

(a) The absence of miosis does not exclude nerve agent poisoning, especially in cases of ingestion or skin exposure. Miosis may occur almost immediately after exposure, or it can be delayed 30 minutes or longer after a mild exposure. When drinking with the M24 mask on, personnel must shut their eyes until the mask is cleared. This will lessen the chance of the eyes absorbing tiny doses of nerve agents. Eye drops may be administered to relieve pain, but they do not return vision to normal. Recovery time depends on individual reactions. Near vision, night adaptation, far vision, and accommodation will slowly return to normal in varying degrees.

(b) During bright daylight, the only effect of miosis on vision may be dimness of vision. During periods of low visibility and at night, dusk, and dawn, the impact of miosis may be significant. Aircrews may not be able to fly.

(c) The impact of miosis on personnel is not limited to aircrews. Ground support personnel in air traffic services (ATS) and AD units and C^2 facilities will also be affected by miosis. This degradation of support capability will affect all aviation missions.

b. *Antidotes.* The nerve agent antidote treatment available for soldiers is the nerve agent antidote kit (NAAK). Each NAAK includes one atropine autoinjector and one pralidoxime chloride autoinjector. STP 21-1-SMCT, FM 8-285, and FM 21-11 describe the procedure for administering the nerve agent antidote.

(1) The NAAK will keep a nerve agent victim alive; every soldier must be thoroughly

trained in its use. Nerve agents are powerful; they require powerful antidotes to keep the victim alive. The NAAK must not be used on a person unless he has actually been exposed to a nerve agent. However, some personnel may panic during the initial encounter of chemical warfare on the battlefield. Many symptoms of other chemical agents, especially toxins, overlap nerve agent symptoms. Therefore, soldiers may misdiagnose the symptoms.

(2) The effects of atropine and pralidoxime chloride on aircrews are being studied. Serious side effects may impact on a person's fitness for flying duty. When an adequate dose of atropine is injected for lifesaving measures, dryness of the mouth is a side effect. This side effect will also occur even if no agent is present in the body and atropine is injected. Three autoinjections may cause hallucinations. One autoinjection probably will not seriously degrade an aircrew's ability to function. Some side effects of atropine are denial of illness, loss of insight, and loss of consciousness. Other symptoms include perceptual difficulty, judgment and memory impairment, confusion, short attention span, slurred speech, and restlessness. These reactions are also similar to the symptoms experienced from incapacitating agents such as psychochemicals, cocaine, and cannabis.

(3) The current nerve agent pretreatment drug is pyridostigmine. The pretreatment is taken every 8 hours. The unit commander will determine when personnel will begin taking the pretreatment. FM 8-285 contains pretreatment procedures.

C-14. BLOOD AGENTS

a. *Effects*. Blood agents are nonpersistent agents. They have an effective duration of from 10 minutes to 2 hours. Within one or two breaths, individuals can inhale a lethal dose of blood agents. Death may follow within 1 minute. Mild exposure will result in the same symptoms as those experienced from lack of oxygen. Soldiers who survive moderate to severe exposure may not be able to return to flying status for several weeks or longer. The damage to cells caused from lack of oxygen may result in persistent fatigue, irrationality, loss of coordination, vertigo, and headaches. One type of blood agent, CK, causes chronic bronchitis.

b. *Antidotes*. No current self-aid/buddy aid antidote exists for blood agents.

C-15. BLISTER AGENTS

Blister agents cause severe skin blisters and respiratory damage. These persistent chemical agents can cause injury in both liquid and vapor forms. These blisters damage the subdermal layers of skin and cell protein structure; the skin and cells take from weeks to months to heal. Very low concentrations of blister agents cause painful eye damage—to include conjunctivitis, edema of the lids, and a feeling of grit in the eye. In large concentration, mustard agents can cause permanent damage, corneal scars, or opacity. A tiny amount of liquid droplet (Lewisite or phosgene oxime) in the eyes may cause permanent injury or blindness. Blister agents cause systemic poisoning throughout the body and can impair performance. Some symptoms are blood pressure decrease, nausea, malaise, and dehydration. Blister agents are not usually lethal, but severe respiratory damage, secondary infection, or dehydration may cause death.

FM 8-285 contains treatment procedures for blister agents.

C-16. CHOKING AGENTS

Choking agents are nonpersistent agents that can cause injury to unprotected personnel. The injury may result in mild eye irritation and damage to the lungs and respiratory tract. The initial choking effect may cause loss of aircraft control. In severe cases, membranes swell, the lungs fill up with fluids, and death results from a lack of oxygen. FM 8-285 contains treatment procedures for choking agents.

C-17. INCAPACITATING AND RIOT CONTROL AGENTS

Irritating agents and psychochemical agents employed by the threat are not usually lethal. They should not cause death unless personnel are exposed to much larger concentrations than normally would be employed on the battlefield. FM 3-9 describes these agents in detail. FM 8-285 describes the effects of these agents and treatment procedures.

C-18. PROTECTION

Even a mild exposure to agents may be fatal to aircrews, because aircraft control may be lost. Also, the long-term, systemic effects of agents and treatments can degrade performance, causing aircrews to be grounded. Flight surgeons must carefully monitor aircrews for symptoms of exposure to agents and advise the commander. When personnel are not wearing NBC protection and exposure to agents is suspected, they may be temporarily grounded and observed for symptoms. However, in the absence of actual symptoms, the tactical situation may preclude preventive grounding. Aircrews should wear full mission-oriented protective posture (MOPP) 4 gear during flight; ground troops must also have adequate protection. Local commanders will make this decision based on METT-T and a risk analysis.

SECTION V. NBC Defense Fundamentals

C-19. CONTAMINATION AVOIDANCE

Contamination avoidance—the first fundamental of NBC defense—means taking the appropriate action to reduce NBC hazards. The term *avoidance* does not necessarily mean aborting a mission or canceling an operation just because contamination is present. The factors of METT-T are considered for all operations, to include entering contaminated areas and preparing to encounter unknown contaminated areas. Soldiers go into hazardous areas only when necessary. Aviation brigades use the NBC warning and reporting system and reconnaissance, monitoring, and survey to help locate contaminated areas.

   a. *Contamination Transfer.*

      (1) All soldiers should understand how they and their equipment become contaminated and how contamination spreads to other personnel and equipment. Contamination refers to the deposit or absorption of hazards.   A unit may be the

target of a threat NBC attack, or the downwind hazard from a contaminated unit may cause agents to drift into another unit's area. Also, a unit may move or fly into contaminated areas from which aircraft can transport contaminated equipment or personnel.

(2) Rotary-wing aircraft can transfer contamination from the ground into the aircraft or vice versa. This transfer occurs when the rotor wash picks up dust, sand, leaves, or other contaminated debris. The debris or liquid droplets are then scattered throughout the aircraft. Some agents are like a fine spray. Although suspended in the air, they can settle on personnel or equipment like dew. Aircraft vibrations increase the settling of agents in remote areas of the airframe such as panel points or rivets. Also, the type of paint on the aircraft affects contamination. Alkyd-based paints absorb the agents like sponges. Newer paints are being developed, such as agent-resistant coatings, that resist chemical agent absorption.

b. *Principles.* The principles of contamination avoidance are applying passive defensive measures; warning and reporting; locating, identifying, and marking NBC hazards; limiting the spread of contaminants; and avoiding contaminants.

(1) *Applying passive defensive measures.* Passive defensive measures reduce the chance of being hit by an NBC attack or, if hit, the aftereffects of the attack. They are not direct reactions to a specific attack but rather are measures taken to reduce vulnerability to being targeted. Each unit must apply the principles of detection avoidance, dispersion, and training to protect personnel and materiel.

(a) *Detection avoidance.* Commanders must train their units in the principles of detection avoidance. If the Threat does not know the location of aircrews, it cannot target them for an NBC attack. Commanders should carefully choose unit positions and CP locations. They must ensure that their troops are protected as much as possible from Threat detection by using natural concealment, cover, and camouflage. In addition, aviation units can use air routes and firing positions that take advantage of natural vegetation and terrain features. These same principles apply to ground units.

(b) *Dispersion.* In some cases, the terrain will not be suitable for concealment. However, commanders can disperse their assets so that the unit presents a less lucrative target. By constantly varying the pattern of unit deployment, the commander avoids stereotypic patterns that allow the threat to identify the type of aviation unit being observed.

(c) *Training*. Units must train to survive initial NBC attacks and to continue their missions with minimal slow down. One goal of this training is to render threat weapons ineffective.

(2) *Warning and reporting*. Once an NBC attack has occurred and personnel have located an area that is contaminated or is threatened by downwind hazards, they must inform affected units without delay. Early warning will give personnel time to protect themselves against the hazard. The warning and the reporting of attacks are

done by simple, standard messages with the NBC warning and reporting system (NBCWRS). The NBCWRS consists of standard reports, system management, and attack warnings. A chemical downwind message gives surface meteorological data so that personnel can prepare fresh chemical downwind hazard predictions. FM 3-3 shows report formats.

(a) *Collection sources.* NBC information is collected from numerous sources. It may be obtained from a direct attack on a unit or after an attack through reconnaissance, monitoring, and survey operations conducted by the aviation brigade or a subordinate unit. Units in attack or hazardous areas will forward monitoring reports.

(b) *Observers.* For nuclear weapons, only designated observers will automatically forward reports on burst parameters. Nondesignated observers collect the information and hold it until it is requested. The squadron commander may select several aircrews as designated aerial observers. Their mission—like that of ground observers—is to obtain nuclear burst information. Aviation units can obtain good visual data such as cloud parameters, approximate ground zero location, and crater size. However, the designated aerial observer team does not necessarily comprise the same personnel as the survey team. Troop commanders determine the composition of the team. Utility or observation aircraft are probably best suited for the designated aerial observer mission.

(c) *FARP elements.* The commander must forward hazard information to FARPs and other separate activities. These elements need hazard information for selecting routes, setting up sites, and selecting clean areas for rest and relief. Unit SOPs should address how messages will be forwarded. Radio communications with ATS facilities may be used as an alternate method of relaying hazard information to FARPs. The FARP probably will become contaminated while support aircraft will remain clean. However, the opposite may also occur. Therefore, aircrews and FARP personnel should establish a standard method of communicating NBC hazard warnings between them. Hand-and-arm signals, panels, flags, or any other type of standard signal should be included in unit SOPs.

(d) *Attack warnings.* Nuclear weapons pose significant hazards to aircraft, whether they are fired by threat or by friendly forces. Therefore, commanders must have a thorough understanding of the attack warnings so that the capabilities of aviation assets are not degraded. Warnings of friendly nuclear attacks ensure that friendly forces have time to protect themselves from the attacks. These warnings are called STRIKWARNs. FM 3-3-1 outlines the message formats. The executing commander will start the warning. Messages must be sent to adjacent units and to the subordinate headquarters whose units are likely to be affected by the attack. When a nuclear strike is canceled, units warned previously must be notified without delay. Local policies may specify a wait time after the planned time of detonation when the message is

automatically canceled. Aviation assets are dispersed throughout the battlefield. The supported unit may not be inside a STRIKWARN zone; therefore, it may not receive the warning. However, aircraft supporting that unit may be where overpressures will cause damage. Because of the long-distance hazard of nighttime flash blindness, aviation units must know when friendly nuclear weapons will be fired. For these reasons, executing commanders should send the attack warning to all aviation units. This message should include the limited safe distance for aircraft or the 1-psi overpressure radius. The limited safe distance is not included in the standard format for STRIKWARNs, but it can be added. Aviation assets, including ground support, must receive information about friendly nuclear strikes. ATS facilities will be used to the maximum extent to relay STRIKWARNs to aircraft operating within the effective ranges of nuclear detonations. Units should develop alternate methods of passing an immediate warning to aircraft during flight.

(3) *Locating, identifying, and marking NBC hazards*.

(a) Once personnel detect an NBC hazard, they must mark and identify the hazard. Units must plan their AO outside of the contaminated area when possible. The unit has three methods of determining the limits of a contaminated area: reconnaissance, monitoring, and survey. Contaminated hazards may be the result of enemy or friendly forces. In either case, the effects are the same; they will affect either threat or friendly operations equally. Therefore, hazardous areas must be located, identified, and marked especially along defiles, routes, and point hazards. Marking may be immediate or hasty. Hazardous areas may be permanently marked later with standard NATO signs.

(b) Aviation assets ideally are suited for conducting reconnaissance and radiological surveys. FM 1-117 and FM 3-3-1 discuss radiological surveys.

(c) Chemical agent detectors or alarms are not mounted on aircraft. Using aircraft with point detectors in this role is not considered a feasible mission. Chemical reconnaissance with aircraft will be limited to flying a chemical detection team to selected areas. NBC detection equipment consists of standard issue items such as radiological detection and monitoring devices, total dose instruments, and chemical agent detection kits and alarms.

(d) Aircrews can help identify contamination on or in the aircraft. They can mount M8 or M9 chemical agent detection paper on the inside or the outside of the airframe at various locations. Because the paper does not stick to the paint on the aircraft, it should be wrapped around a painted area with the ends of the paper overlapping. Recommended areas for mounting this paper include the inside and outside of Plexiglas, seat frames, landing gear, floor panels, or other areas where agents are likely to collect. When the paper is placed on exterior Plexiglas, the spots can be seen from inside the cockpit

during the day. Ground support personnel can read the paper on other exterior surfaces. Personnel should not use the paper in a way that creates a FOD hazard.

NOTE: M9 paper detects liquid agents; however, the M9 paper may not react significantly to a vapor or an aerosol hazard.

(4) *Limiting the spread of contaminants.*

(a) When operating in a contaminated area, all personnel must take steps to limit further exposure to the hazard. One solution is to move personnel out of the contaminated area if the factors of METT-T permit. Aviation assets can often find clear routes through a contaminated area so that exposure to NBC hazards is reduced. If movement is not possible, the unit must employ individual and collective protection measures to prevent casualties. Almost any shelter that protects from the weather will also protect somewhat from fallout and liquid chemical agents.

(b) Personnel can cover ground equipment in the FARP and rear areas to avoid direct contact with contaminants and then discard the covers to operate the equipment. Examples of covers are tarpaulins, plastic bags, and cardboard boxes. If possible, personnel should keep equipment in original containers; for example, ammunition cans. Personnel can also place equipment in covered vehicles or shelters and operate it from these locations. These measures decrease the amount of contamination transfer and may reduce the need for decontamination.

(c) Protective measures for aircraft are like those for ground equipment. Areas that provide natural cover should be used for unit locations. Aircrews can park aircraft near buildings in built-up areas for limited protection. If assault or medium helicopter units pick up or deliver troops in contaminated LZs, aircrews must ensure that doors, vents, and windows are closed to reduce contamination transfer.

(d) Placing a cover on the floor of the cargo area also helps reduce the amount of contamination transfer to the interior of the aircraft. Plastic covers, tarpaulins, paper, cardboard, clothing, or even leaves can aid in limiting contamination transfer. However, covers must be secured so that they do not present an FOD hazard. When flying rotary-wing aircraft out of contaminated areas and into clean areas, aircrews should open all doors and windows. About 20 minutes of flight will rid the aircraft of accumulated vapor hazards, but liquid contaminants will remain a hazard.

(5) *Avoiding contaminants.*

(a) The best way aircrews can keep aircraft free from contamination is to avoid flying them into contaminated areas. However, aircrews have no onboard means of determining, in the air or on the ground, which areas are

contaminated. Therefore, they may be unable to avoid contaminated areas. Contamination avoidance also applies to ground support locations such as FARPs. FARPs are vulnerable because of their mission, but their mobility may lessen the chance of their being targeted by Threat forces. Aircraft are also vulnerable while being serviced at FARPs.

(**b**) Commanders must rely heavily on the NBCWRS and intelligence reports to learn what battlefield areas are contaminated. However, some areas may not be reported and new attacks may occur at any time.

(**c**) Another source of information comes from the supported unit. Commanders should select alternate locations where they can complete their mission if the AO becomes contaminated. The flexibility of aviation assets allows aircrews to "fly around" known contaminated areas and still accomplish the mission. When choosing among options, however, the commander knows the primary consideration is always mission accomplishment.

C-20. PROTECTIVE MEASURES

Protection—the second NBC defense fundamental—is both individual and collective. When the unit cannot avoid contamination, or is under direct attack, soldiers must take appropriate actions to survive. Specific actions are taken before, during, and after an attack. To sustain operations in an NBC environment, unit personnel must understand and practice individual and collective protection. Individual protection involves those measures each soldier must take to survive and continue the mission. These include acting immediately upon observing a nuclear detonation, donning MOPP gear, and wearing other protective equipment and devices. Collective protection provides a contamination-free working environment for selected personnel and precludes the continuous wear of MOPP gear.

a. *Individual Protective Equipment and Clothing.*

(1) *MOPP gear.* Soldiers are issued MOPP gear to protect themselves from a chemical or biological hazard. MOPP gear consists of the CB protective mask, hood, overgarment, overboots, protective gloves, individual decontamination kit, detection equipment, and antidotes. FM 3-4 describes each item, to include service life and proper use.

(2) *Nomex flight suit and gloves.* Until a fire-retardant overgarment is fielded, aircrews will continue to wear the Nomex flight suit and gloves under the overgarment and protective gloves. When aircrews wear the Nomex gloves, they do not need to wear white cotton inserts.

(3) *Aviation life support equipment.* All soldiers must be issued a mask, an overgarment, chemical protecting gloves and chemical protective overshoes in the correct sizes. Soldiers should ensure that they have the correct glove size so that their tactile sensitivity is not degraded. The size of the overgarment depends on the unit's policy for wearing aviation life support equipment (ALSE). Usually, soldiers will wear the ALSE over the over garment. During an emergency in a CB

environment, aircrews need access to the contents of the survival vest. If the vest is worn under the overgarment, the soldier risks contamination to get to the vest. Commanders should carefully evaluate their policy and requisition overgarment sizes accordingly.

(4) *Night vision devices.* Current procedures state that aircrews should wear the mask hood over the flight helmet. When flying with night vision devices (NVDs) that attach to the flight helmet, aircrews will have to wear the hood under the flight helmet. Units preferring this procedure should procure the hood for the M25 mask, which is designed to be worn under the helmet. Wearing the hood under the helmet creates more hot spots; individuals may need to be refitted with a larger size helmet.

(5) *M10A1 canister.* Commanders should carefully evaluate whether individuals should change their own canisters. Changing the M10A1 canister is currently an organizational-level maintenance task. However, aviation personnel are widely dispersed on the battlefield; maintenance or NBC personnel may not be available to change the canisters. Blood agents will degrade the canister, requiring the operator to change it after an attack. Therefore, aircrews should receive training in the procedure for changing the canister.

(6) *M24 mask.* When wearing the M24 mask while operating the AH-1 Cobra telescopic sight unit, aviators should be careful not to scratch the mask lens. They should use a clear visor over the mask lens to prevent scratches. Some aviation units will receive M43 masks to replace the M24 masks.

(7) *Mask carrier.*

    (a) In some aircraft, aircrews may not have room to wear the mask carrier during flight. If not, the items from the carrier that are needed during flight should be stored in the aircraft or in the protective clothing. Units should establish a policy so that aircrews know what procedures they are to follow. The procedures will vary with the type of aircraft; therefore, units are encouraged to examine several possibilities and then establish standard procedures for each aircraft.

    (b) Some of the items that will be needed during flight are the antifog kit, M291 or M258A1 skin decontamination kit, antiglare shield, and antidotes. Soldiers can take the packets of the decontamination kit from the hard plastic container and put them in overgarment pockets. Also, personnel can make a storage area inside the cockpit for the carrier or the M258A1 kit and antidotes.

(8) *Skull cap.* Some personnel have procured the skull cap, a small cap of Nomex material worn under the flight helmet to keep the helmet from irritating the scalp. The skull cap can be worn under the mask head harness if it does not interfere with the seal of the mask about the face. If the cap is worn inside out, the seams will not dig into the scalp and cause more irritation.

(9) *Overboots.* Overboots can present a safety hazard (foot slippage) if personnel use laces stretched from wear or do not tie the laces properly during training. The green vinyl overshoe (GVO) will be worn for actual operations until the multipurpose light overshoe (MULO) is fielded.

(10) *Gloves.* During maintenance—such as preflight, postflight, and FARP operations—personnel can easily tear their protective gloves on the aircraft. When personnel perform maintenance tasks, they should consider wearing a leather glove over the chemical biological (CB) protective glove; but they should remove the leather glove before they fly.

(11) *CB mask.* The CB mask is required for protection against chemical agents. However, it also can protect aircrews from radioactive dust while they conduct aerial surveys or other missions over radiologically contaminated areas. The mask filters out dust or dirt that has radiological agents. In the absence of a CB threat, soldiers may wear other protection such as surgical masks or handkerchiefs. Aircrews may elect to wear the CB mask to keep the large amounts of dust that are present from irritating the eyes.

(12) *Faceform.* A faceform is used to store the aircrew protective mask to prevent face set. Units may elect to keep the faceform in place to lessen the damage when the mask is being carried. The unit SOP should specify when to carry or remove the faceform.

(13) *External drinking adaptor.* TM 3-4240-280-10 and STP 21-1-SMCT describe the procedures for drinking water when personnel wear the M24 mask.

b. *Mission-Oriented Protective Posture.* Commanders select a level of protection based on the chemical or biological threat, temperature, work rate, and mission. The levels of protection are MOPP zero through MOPP4 plus a mask-only and a MOPP-ready option. FM 3-4 describes the MOPP levels and option. Aircrews fly in MOPP4 gear when a high threat of CB agent use exists or when agents have been used on the battlefield. Aircrews also fly in MOPP4 gear when they conduct NBC reconnaissance operations. Some of the reasons for this are as follows:

(1) Personnel cannot detect agents with their senses.

(2) Agent clouds travel vertically as well as horizontally.

(3) Aircrews exposed to CB agents may be grounded for an extended period.

(4) Aircraft are not equipped with advanced warning or detection devices.

(5) It is not practical to don CB equipment, including the mask, during flight.

(6) Aircrews exposed to sublethal dosages of CB agents during flight may lose control of the aircraft and crash.

(7) Rotor wash may transfer droplets or contaminated dust inside the cockpit, creating a skin contact hazard.

(8) Aviation mission.

Appendix D

Combat Search and Rescue

Aviation units must be prepared to conduct combat search and rescue (CSAR) in support of their own operations and to provide support to both intra- and inter-service levels. CSAR planning should begin before forces deploy or immediately after arrival in the area of operations. Aviation units must develop a complete CSAR posture using a planning process that is fully complementary to ongoing operational planning. CSAR plans must be designed with the flexibility to employ all Joint CSAR-capable resources, in the most efficient and effective manner. For detailed planning of CSAR operations, units should refer to FM 90-18.

SECTION I. Command Responsibilities

D-1. COMMANDER

The commander of the Army Force (COMARFOR) has primary authority and responsibility to plan and conduct CSAR in support of his own forces. To plan such operations, he will consider the capability of his own forces as well as those of other service components, if available. He will execute his CSAR responsibilities through the following actions:

a. *Rescue Coordination Center (RCC).* Establish an RCC* to—

(1) Coordinate/monitor all subordinate unit CSAR activities.

(2) Coordinate all Army-external CSAR requirements as necessary with the Joint Search and Rescue Center (JSRC).

(*As an option, designate RCC responsibilities to a lower subordinate echelon (for example, the senior aviation tactical commander).

b. *Intra-Service Support.* Ensure that—

(1) Army forces (ground and aviation) are aware of existing CSAR capabilities within the total force structure.

(2) Subordinate Army unit commanders understand the parameters within which CSAR forces will operate; i.e., factors based on mission, enemy, terrain, troops, and time available (METT-T); available assets; weather; etc.

(3) Army forces are knowledgeable of the procedures for requesting CSAR.

(4) Both command and coordination channels are actively involved in the execution of intra-service CSAR operations.

c. *Signal.* Ensure that—

(1) Subordinate units equipped with survival radios are provided signal operating instructions (SOIs).

(2) Deconfliction of frequency usage is enforced throughout the command.

(3) CSAR-only code words and radio frequencies are established for common usage across the component, if not provided by Joint headquarters; for example, frequency modulation (FM), ultra high frequency (UHF), very high frequency (VHF), and satellite communications (SATCOM).

(4) If the Joint headquarters does provide CSAR-only code words and frequencies, information is disseminated to subordinate commands.

d. *Joint Support.*

(1) Provide mutual CSAR support to other service components when tasked through the joint search and rescue center (JSRC).

(2) Ensure that both the command and coordination channels are actively involved in the inter-service planning and execution of Joint CSAR operations, and that unity of effort is maintained throughout.

(3) In the same context, ensure that interoperability requirements—such as communications compatibility, fuel types/standards, refueling equipment, and map series—are consistent with Joint requirements.

e. *Augmentation Personnel.*

(1) Provide personnel as tasked from the JSRC to support JSRC operations. The number of personnel provided will be based, preferably, upon an equal percentage of personnel provided from other service components.

(2) Ensure that augmentation personnel are familiar with Joint Publications 3-50.2 and 3-50.21.

f. *Aircraft Destruction Authority.* Establish a policy designating aircraft destruction authority in the event of probable enemy retrieval.

g. *Training.*

(1) Task organize combined-arms forces to develop and promote habitual CSAR relationships and an understanding of CSAR tactics, techniques, and procedures (TTPs).

(2) Request and coordinate Joint level training to prepare for CSAR contingency operations.

D-2. UNIT COMMANDERS

Unit commanders must—

a. Conduct CSAR operations to support their own operations.

b. Provide mutual CSAR support at both the intra- and inter-service levels.

c. Ensure CSAR contingencies are incorporated into all mission plans; be prepared to generate CSAR support requests as required.

d. Complete the following actions before or immediately after deployment:

(1) *Standard operating procedures (SOPs).* Develop SOPs including TTPs to be used to conduct CSAR operations; ensure unit personnel are familiar with associated CSAR publications. TTPs must encompass CSAR operations across the full spectrum of military operations within the theater of deployment. As a minimum, CSAR SOPs should include—

- Isolation preparation packets (ISOPREP) with pictures and verbal identification information.
- Evasion plans of action.
- Signaling procedures.
- CSAR alert procedures (horizontally/vertically).
- Task organizing procedures (attachments/detachments).
- Threat update procedures.
- Search techniques.
- Reporting requirements.
- Notification/authentication techniques.
- Recovery procedures.

(2) *Signal.* Ensure that personnel who may be operating search and rescue/survival equipment—

(a) Are technically proficient (for example, that certain aviation personnel know how to operate the Global Positioning System (GPS), the Personnel Locator System (PLS), and crew survival radios).

(b) Are knowledgeable of the SOI procedures that support those technical systems.

(3) *Training.*

(a) Task organize unit forces to develop and promote habitual CSAR relationships and an understanding of CSAR TTPs.

(b) Request and coordinate combined arms training to prepare for CSAR contingencies.

D-3. ON-SITE COMMANDER

The on-site commander is the person in charge of executing a mission in a given area when an

isolated personnel situation develops in that same area. He may not be the unit commander, as elements of a given unit may not be operating within the unit commander's immediate sphere of influence. He must—

a. Make a rapid assessment of the situation to determine his actions.

b. Report the isolated personnel's situation as soon as possible to the next higher command. With information that may not be readily available to the on-site commander, the next higher command can influence the on-site commander's decision to execute the recovery. This information may include other friendly forces operating in the same area, or a new development in the tactical situation requiring immediate action which may or may not support immediate recovery.

SECTION II. Command, Control, and Communications

D-4. COMMAND AND CONTROL

a. The Army component commander retains command and control (C^2) over all component assets within an area of operations (AO). These assets do not include those under the operational control (OPCON) of other components. Unit commanders retain OPCON over their assets; however, initial control of CSAR operations rests with the on-site commander. If immediate recovery of isolated personnel is not feasible, C^2 passes up through the chain-of-command. This is true also if the ability to construct the CSAR operation exceeds the capability of the on-site assets. C^2 of the CSAR effort remains in Army channels until a request for support is accepted by the JSRC. The JSRC has OPCON of all assets once the request for support is accepted. The JSRC maintains OPCON of CSAR resources augmented to the center.

b. The example scenario begins with a downed aircraft/isolated personnel situation. The air mission commander (AMC), or acting AMC, is the on-site commander. The on-site commander must decide—based on METT-T—whether to execute an immediate extraction of the isolated personnel or waive the operation. As the process is elevated to higher echelons, the necessity to request Joint support may arise. Once Joint support is requested, the RCC will transmit/receive and monitor all information pertinent to the operation. Key to any well-run CSAR operation is the information flow along both command and coordination channels.

D-5. COMMUNICATIONS

a. *Radios.*

(1) Secure voice communication is the primary method to command, control, and coordinate CSAR operations. Commanders need to be aware that nonsecure communications can jeopardize the status of the isolated personnel as well as that of the rescue forces.

(2) Commanders need to understand communications capabilities within the context of CSAR operations. Secure radios, or radios expected to have secure capability in the near future, include—

    (a) *Satellite Communications (SATCOM).* SATCOM provides the longest range (transcontinental) and most flexibility to the commander. Distance and geographics become nonfactors in the communications sequence. SATCOM equipment is easily transportable; it can be quickly assembled. Because of the possibility of simultaneous and multiple user situations, channel accessibility may become an issue.

    (b) *High Frequency (HF).* HF is a non-line of sight (LOS) radio primarily used for air-to-air and air-to-ground communications. Range/clarity limitations occur in direct proximity to the aircraft's relationship (altitude) above the ground. Ground-to-ground HF communications can be extremely unreliable.

    (c) *Very High Frequency (VHF).* VHF is a LOS communications capability. VHF is used primarily as a civilian administrative wave band. All military aircraft have VHF capability. However, most tactical operations centers (TOCs) do not use this system.

    (d) *Ultra High Frequency (UHF).* UHF is a LOS communications capability with greater range than the VHF system. UHF is primarily used for aircraft-to-aircraft and aircraft-to-control tower communications. Most tactical operations centers (TOCs) do not use this system.

    (e) *Frequency Modulated (FM).* FM is a LOS communications capability. FM is the most widely used communications forum with capabilities found in most military aircraft and TOCs.

b. *Landline.* Secure telephones (STU-III/STU-III plus) provide the commander with "HOTLINE" capability; they may prove critical in the initial phases of a CSAR alert to higher headquarters. However, the tactical situation could prevent practical usage of this type equipment because of landline connections (limitations) over large distances.

c. *Computer Networks*. A local area network (LAN), established both vertically and horizontally, facilitates the flow of critical CSAR information between the various echelons and components. The RCC should have access to the LAN to expeditiously receive/coordinate essential information on the inter- and intra-staff levels.

SECTION III. Rescue Coordination Center

D-6. RESCUE COORDINATION CENTER

The RCC is the hub of a deployed Army force CSAR operation. Preparing to conduct CSAR operations requires the execution of certain organizational, operational, and administrative

procedures. This section provides guidance on these procedures.

D-7. RCC ORGANIZATIONAL PROCEDURES

a. *RCC Responsibilities.* The COMARFOR will establish the RCC. The COMARFOR has the authority to delegate RCC responsibilities to the branch senior tactical commander of any maneuver force under his command. However, that commander may not further delegate RCC responsibilities to a subordinate unit within his command. For example, a battalion-size aviation task force commander may be the senior (aviation) tactical commander. He may be delegated RCC responsibilities from the COMARFOR, but may not delegate RCC responsibilities down to the company/troop level.

b. *RCC Location.* The RCC will be collocated with the operations center of the command echelon to which it has been assigned. For example, an aviation brigade may be assigned as a subordinate unit within a larger Army force; the COMARFOR may delegate RCC responsibilities to the aviation brigade. If so, then the RCC must be collocated with the aviation brigade's operations center. The RCC may not be collocated with an operations center subordinate to the brigade's operations center.

c. *RCC Personnel.* Persons assigned to the RCC should be trained to plan and coordinate CSAR missions at the appropriate command level; i.e., the command level responsible for RCC operations. These persons should be trained before they arrive at the RCC, but they may receive on-the-job training. In addition, they must be trained and ready to interface with the JSRC. This means they must study applicable reference material. They should have a working knowledge of service-unique doctrines such as the Navy's "strike rescue" or the Marine's tactical recovery of aircraft and personnel (TRAP). A sufficient number of personnel should be assigned to the RCC to conduct/monitor 24-hour operations.

D-8. RCC OPERATIONAL PROCEDURES

a. *RCC Communications.*

(1) The RCC needs communications equipment to support coordination both horizontally and vertically. Communications equipment required by the RCC includes both radios and landlines. If the Joint force and/or Army force headquarters are using a computer network, the RCC should also have this capability.

(2) Most CSAR communications will be backed up by message traffic. Much of the intelligence and information required to plan and conduct CSAR missions will be provided by message. CSAR mission taskings will also normally be transmitted in this mode.

b. *Air Tasking Order/Special Instructions (ATO/SPINs).* In a Joint environment, all airspace usage is coordinated through the airspace coordination authority (ACA). The ACA publishes an ATO/SPIN, which all aviation units operating within the Joint force should receive and monitor.

(1) *Air tasking order.* The ATO tasks assigned and attached aviation units to

accomplish specific missions. The windows (allotted time frames) for requests/taskings (input/output) may vary according to a theater. The RCC will monitor the ATO. The RCC will stay abreast of all Army subordinate unit missions that may place personnel in an isolated situation.

(2) *Special Instructions (SPINs).* The nature of CSAR presupposes short-notice, contingency-like operations. The RCC needs to ensure that every ATO provides enough (a reserved block) transponder codes for an Army aviation CSAR task force. These transponder codes are found in the SPINs section of the ATO. They are needed for air-tracking in a Joint environment. Preplanned transponder codes are tagged for CSAR-only missions. These codes will ensure that monitoring Airborne Command and Control platforms—such as the Navy E-2 Hawkeyes or the Air Force Airborne Warning and Control Systems (AWACS)—recognize immediately the nature of the CSAR mission in progress. These high-altitude C^2 platforms should be notified of an Army CSAR mission through normal command and/or coordination channels; however, preselection of transponder codes—dedicated to an Army CSAR force—ensures fewer administrative procedures once a CSAR alert has been initiated. Fewer administrative procedures equate to a more timely operation.

c. *Alerts.*

(1) The RCC will—

(a) Receive and log any planned or executed CSAR operation conducted by an Army unit; receive all status reports; update the commander/operations officer as required.

(b) Alert all Army subordinate commands operating in, and around, the isolated personnel's area and appraise those commands of the current situation.

(c) Alert the JSRC whenever a CSAR operation has been planned, executed, or is ongoing within the Army component; update the JSRC as required.

(d) Receive and log any Joint CSAR operational information transmitted from the JSRC.

(e) Receive all Army CSAR taskings from the JSRC.

(2) During the alert phase of a CSAR operation, certain critical information must pass from the RCC to Army subordinate CSAR forces or to the JSRC. An example of critical information on a downed aircraft situation follows:

- Identification of downed aircraft (type/call sign)
- Crew radio identifier code (if available)
- Location of downed aircraft
- Status of personnel (injuries/mobility)

- Estimate of aircraft damage
- Evidence of chemical contamination
- Accessibility to downed aircraft (terrain/weather)

d. *Isolation preparation packets.* Once the RCC has been alerted of an "isolated personnel" situation, the RCC will—

(1) Request an ISOPREP from the owning unit by the fastest secure means available.

(2) Be prepared to provide this information to an Army CSAR task force or to the JSRC.

(3) Ensure that the ISOPREP form (DD Form 1833) has been fully completed before accepting/transmitting the information from/to another staff.

e. *Requests for Support.* The RCC is the focal point for all Army CSAR support requests, generated up from Army subordinate units or tasked from the JSRC.

f. *Taskings*.

(1) ***Tasking Authority.*** The RCC will—

(a) Have tasking authority over all available CSAR assets within a deployed Army force structure.

(b) Coordinate subordinate unit taskings with the commander/operations officer of the echelon to which the RCC is assigned before tasking a subordinate unit.

(2) ***Tasking Procedures.*** The RCC will notify—

(a) The unit tasked to conduct the CSAR operation.

(b) The unit tasked as to the number and type equipment required; the unit assuming C^2 of the operation if the CSAR force is to be task organized; for example, different type airframes from different type units.

g. *Intelligence/Information.* The RCC—

(1) Will be responsible for passing intelligence/information to the Army CSAR task force or to the JSRC. The RCC may receive intelligence/information from any or all of the following in to portray as accurate a threat situation as possible:

- G2/S2 staff officer.
- G3/S3 staff officer.
- Unit of the isolated personnel.
- Ground/aviation units.
- JSRC.

(2) Must keep the JRCC in the "loop" during all phases of the CSAR operation. An isolated personnel situation generates top-down and bottom-up threat analysis focused on the targeted area of CSAR operations.

D-9. RCC ADMINISTRATIVE PROCEDURES

The RCC should—

a. Review all Army force operations plans (OPLANs) and operations orders (OPORDs).

b. Ensure that CSAR annexes are included. (These annexes should be detailed as far as precise actions, executable by the various potentially involved echelons.)

SECTION IV. Planning CSAR Operations

D-10. OPERATIONAL PLANNING

a. *CSAR Planning.* CSAR planning should begin when the Army force deploys or immediately after it arrives in the AO. The Army force should—

(1) Develop a complete CSAR posture.

(2) Use an orderly, logical planning process fully complementary to ongoing operational planning. (This concurrent planning approach should ensure a concept of CSAR operations and support that details specific responsibilities and authority.)

(3) Design Army CSAR plans with flexibility to employ, first, all Army CSAR-capable resources—second, all Joint CSAR-capable resources—in the most efficient and effective manner.

(4) Consider CSAR policies set by higher echelons, and any planned or ongoing operations that may assist or otherwise support a CSAR mission.

(5) Consider reversing the airspace conflict.

(6) Consider combined arms support and coordination.

b. *CSAR Policy.* Normally, the theater commander develops and distributes a theater CSAR policy that provides broad, general guidance on the level of effort and the conditions under which additional resources may be committed to CSAR. The Army force commander must then implement the theater policy by establishing—

(1) Basic GO/NO-GO criteria that indicate under what conditions and circumstances he is willing to risk additional assets to conduct a CSAR mission.

(2) Conditions that require the use of Joint CSAR-capable resources.

c. *Planned/ongoing operations.*

(1) *Planned/ongoing operations.* These operations can contribute to a CSAR mission. They can divert enemy activity from the area of the isolated personnel. They can provide on-scene resources that may complement a CSAR effort. Complementing resources may include—

- Aircraft (fixed-wing and rotary-wing) returning from a mission with unexpended ordnance.
- Helicopter lift assets capable of hauling personnel/equipment.
- Airborne C^2 platforms.
- Other Joint/combined-arms units whose weapon systems/personnel can influence the CSAR AO.

(2) *Other friendly force coordination benefits.* These may include—

- Friendly force coverage or planned coverage of the intended search area during an other-than-CSAR type mission.
- Fratricide prevention.
- Disruption of friendly operations.

(3) *Artillery.* Artillery fire support can be planned for all phases of the CSAR operation. Planned fire missions may include—

- Suppression.
- Diversion.
- Illumination.
- Smoke.

d. *Army Airspace Command and Control (A^2C^2).* A^2C^2 will play an important role in concurrent CSAR mission planning. Critical to the CSAR mission will be the ability of the Army force commander to—

(1) Alert appropriate friendly forces as to the impending CSAR operation; for example, providing air defense (AD) units critical information on friendly aviation units operating in a given area.

(2) Notify the JSRC of intentions to operate aircraft/unmanned aerial vehicles (UAVs) within a given area.

(3) Reserve blocks of transponder codes for the synchronization of airspace usage.

e. *Day/Night Operations.* When planning CZAR operations, commanders must consider available CSAR-capable resources. Daytime CSAR operations offer the advantage of improved visibility when conducting searches. The disadvantage is an environment that enhances threat visual contact and weapon's engagement capabilities. Nighttime CSAR operations provide the advantage of a reduced threat visual acquisition, but can severely degrade visual recognition between rescuing forces and isolated personnel.

D-11. PRECAUTIONARY CSAR

Precautionary CSAR planning—

a. Is planning and propositioning aircraft and/or ground forces before an operation to provide CSAR assistance, if needed?

b. May be conducted concurrently with the Army force's operational plan.

c. May be conducted as a corollary planning effort when Army CSAR-capable resources are tasked to provide support for another component in the Joint force.

D-12. CSAR RESOURCES

Any or all of these Army forces may be available to the COMARFOR for the conduct of CSAR operations:

a. Rotary-wing aviation units.

b. Special operations forces (SOF).

c. Long-range surveillance units (LRSU).

d. Ground maneuver forces.

e. Army watercraft units.

D-13. EVASION PLAN OF ACTION

Army Regulation **(**AR) 525-90 stipulates that evasion plans of action (EPAs) will be filled out by aircrew members flying in a hostile environment. SOF and LRSU personnel also need to develop EPAs because of the nature of their missions. EPAs may need to be adjusted on a mission/AO basis. Refer to FM 90-18 for EPA considerations.

SECTION V. CSAR Decision/Execution Process

D-14. KEY EVENTS/DECISIONS/ACTIONS

This section addresses the key events, decisions, and actions that comprise a successful CSAR operation. CSAR is an event-driven operation that requires quick analysis and timely decision making. Commanders involved in CSAR operations must weigh all associated risks. They must decide how many personnel and how much equipment are worth placing in potentially isolated situations for the rescue of those currently isolated. In other words, commanders must judge whether the cost of executing the CSAR operation justifies the resultant benefits.

D-15. DECISION/EXECUTION PROCESS

The CSAR decision/execution process is the same at all levels of command. Commanders decide if, when, and how to execute CSAR based on current mission impact, CSAR mission

analysis, and available assets. An explanation of these key elements follows:

a. *Mission impact.* Mission impact is the first gate in the commander's decision/execution cycle. The current tactical situation and future operational plans will influence the commander's decision as to the "if" and "when" the CSAR operation can be conducted. CSAR must never supplant or hinder the unit's primary mission. Commanders must ensure that unit focus remains trained on current operations; and, only after the success of any planned future operations is reasonably ensured, can the decision process continue.

b. *CSAR mission analysis.* CSAR mission analysis is the next step in the CSAR decision/execution process. CSAR mission analysis includes an assessment of the following:

(1) *Location of isolated personnel.* The known or unknown location of isolated personnel will indicate the amount of time a CSAR force can expect to stay on station. This, in turn, will affect both the probabilities of detection by threat forces (survivability) and the logistics (primarily fuel) of the operation.

(2) *Threat.*

(a) *Situation.* The threat situation in the area of the isolated personnel is the single most important factor affecting CSAR mission analysis. The threat situation will—first and foremost—dictate whether a CSAR mission will be conducted or not. If a CSAR operation will be conducted, the threat situation will influence the who, what, when, and where of the executing CSAR task force. The threat can range from electronic warfare (EW) to enemy fixed-wing aircraft; rotary-wing aircraft; small arms; armored vehicles; man-portable and vehicle-mounted AD systems; and the local civilian populace.

(b) *Location of military/civilian threat.* The CSAR force commander must consider all personnel—military and civilian—and all weapon systems within the CSAR AO. He must determine the appropriate rescue vehicle and mode of operation. The intelligence chain (G2/S2) must, therefore, seek as much current information/intelligence as possible on the location of the military/civilian threat. The current location of the military/civilian threat in proximity to the isolated personnel shapes the CSAR commander's decisions by influencing the—

- Timeframe within which certain decisions must be made.
- Probabilities of isolated personnel capture.
- Abilities of isolated personnel to execute EPA.

(c) *Strength of military/civilian threat.* The strength of the military/civilian threat shapes the CSAR commander's decisions by influencing the—

- CSAR task force organization.
- Search and recovery procedures.

(d) *Threat air defense.* Assessment of threat AD capabilities will impact the—

- Decision to use aerial recovery assets.
- Extent to which aerial assets from other service components can be expected to operate in the same area.
- Aerial ingress, search, and egress procedures.

(e) *Enemy courses of action.* The probable enemy course of action will affect the tempo of the decision/execution process. Future proximity of the threat in relation to the isolated personnel's location—or intended extraction point—will help the commander decide the best time and right mix of forces to execute the operation.

(3) *Isolated Personnel Status.*

(a) *Injuries.* Injured isolated personnel can hinder the CSAR operation in numerous ways. Initially, injuries may prevent isolated personnel from establishing contact with other friendly forces. Injured personnel may not be able to comply with established evasion and recovery plans. Injuries affect the organization of the CSAR task force; for example, the incorporation of medical evacuation (MEDEVAC) assets.

(b) *Captivity.* Intelligence resources may indicate a high probability of capture. If so, the personnel and equipment the commander is willing to risk in the CSAR operation will be proportionately constrained.

(4) *Environmental Factors.*

(a) *Weather.* Current and shifting weather patterns in the isolated personnel's area will impact the GO/NO-GO criteria of the operation. Preferably, weather will be acceptable not only in the targeted or expected area of personnel and/or equipment recovery, but throughout the entire search grid. Weather information should include—

- Temperature.
- Precipitation.
- Humidity.
- Visibility at ground level.
- Winds.
- Fog.
- Cloud cover.

(b) *Astronomical data.* Astronomical data can play an important role in determining when the CSAR operation will be conducted. Astronomical data includes sunrise, sunset, moon rise, and ambient light.

(c) *Terrain.* Isolated personnel and/or equipment must be accessible by the system used for recovery. CSAR task forces will operate in different modes

according to terrain and natural and man-made obstacles.

c. *Resources.*

(1) The next step in the decision/execution process is the assessment of unit resources. Commanders must decide if they have the resources within their units to conduct the CSAR operation. Naturally, access to resources increases the higher the operation is elevated.

(2) Resources are formed into a CSAR task force. This task force will search for and recover isolated personnel and/or equipment. In addition, the CSAR task force must be able to provide organizational security while en route to the isolated personnel's area, and maintain security during the recovery and return to assembly area phases of the operation.

(3) *Task organization.* The factors that make up a CSAR operation preclude a standard CSAR task force organization. Commanders must look at the requirements of the mission, assess their own unit's capabilities, and request external support as necessary.

(a) Table D-1 illustrates an example of an aviation task force organized with assets from several different type units. This organization is assuming the mission of personnel rescue at a downed aircraft site with the additional intent of airframe recovery. The terrain is rugged and sparsely vegetated. The enemy situation is some lightly armored vehicles and tanks operating within the area. Crew personnel at the downed aircraft site have been injured and are unable to execute an EPA.

(b) After assessing all the factors involved, the aviation task force commander decides to task organize according to the following justifications:

Table D-1. Aviation unit task organized by mission

ASSETS	QTY	JUSTIFICATION
UH-60	1	Command and control
UH-60	1	Security force lift
AH-64	5	Antiarmor
UH-60	1	Personnel recovery
CH-47D	1	Airframe recovery
Troops	11	Ground security

NOTE: Crash rescue personnel (corps engineer support) must be considered in all CSAR operations requiring extrication of personnel from downed airframes.

SECTION VI. Search and Recovery Procedures

D-16. ISOLATED PERSONNEL

a. *Immediate Actions.* Isolated personnel actions are critical to the SAR procedure. Isolated personnel must make every attempt—within the context of the current situation—to contact the on-site commander or other friendly personnel. Prohibitions to this action may include personal injury, the threat, communications capabilities and/or communications failure. If voice communications can be established, isolated personnel must provide location, personnel injuries, threat status, and intentions to the receiver.

b. *Signaling*

(1) In a situation when Army personnel presume isolation in the immediate future, they must try to establish radio contact on the last frequency used. In a hostile environment, transmissions should be as brief as possible to avoid detection/location by threat forces. In a permissive environment, transmissions should be long enough to enhance the use of friendly direction finder (DF) equipment (see para D-1c). In either case, once contact with friendly forces is made, isolated personnel should announce (by use of a code word) switching to a predesignated CSAR operations frequency. This is true if immediate recovery is impossible.

(2) Isolated personnel using emergency or CSAR-only frequencies may receive transmitted responses from both Army component and Joint aviation assets. Refer to FM 90-18, Appendix I, for a complete description of Army radio survival equipment.

(3) Initial radio contact with isolated personnel may occur on any number of radio bands. If the isolated personnel are disoriented—and the tactical environment permits—one option is to establish contact on the FM band. This would allow any Army aviation elements in the area to establish an azimuth to the isolated personnel from a known location (i.e., the position of the aircraft). If immediate recovery of isolated personnel is not possible by the aviation element, a probable search area can be referenced for future CSAR operations. Aviators must consider the tactical situation when conducting FM Homing operations. This includes reception altitude restrictions relative to the AD threat.

D-17. SEARCH PROCEDURE

Isolated personnel will fall into one of two categories—their location is either known or unknown. The assumption can not be made that isolated personnel have successfully executed their EPA and will be at the extraction point at a given time. Therefore, unless confirmation of the isolated personnel's location has been established, CSAR force commanders will assume that their missions will require extensive searching procedures.

a. *Isolated Personnel Location Known.* This situation usually will result from some form of contact (electronic/visual) between the isolated personnel and another friendly force, and the isolated personnel is able to provide exact location. Search procedures then become a matter of tactical extraction procedures used by the type unit involved. For example, an air assault aviation unit might conduct this extraction as a one or two ship mission, using the same TTPs as any other given air assault mission under the same tactical circumstances.

b. *Isolated Personnel Location Unknown.* The search procedures for locating isolated personnel whose location is not known are considerably more complex than in a known location type situation. The following is a breakdown of the various types of search techniques:

(1) *Ground search.* Terrain, vegetation, weather, and/or the threat may prevent search by aviation assets. When this happens, elements of maneuver ground forces or SOF may be required to conduct search operations for isolated personnel. The ground force can complete a detailed search of an area without drawing much attention. In addition, the logistics (fuel requirements) supporting extended search time on-station are considerably less demanding. Once isolated personnel have been found, ground forces can return to friendly positions or call for helicopter extraction.

(2) *Aerial search.* Aviation assets can cover significant tracks of land in very condensed time periods. Aerial search is a method of search to be used when time and terrain are significant factors in the CSAR operation.

(3) *Methods.* Most Army operations consider terrain to be a critical element in mission planning. EPAs may include parameters and/or objectives based on terrain. Terrain provides orientation, enhances navigation, and offers protection. Search procedures also use terrain in a systematic approach to locating isolated personnel. A list of terrain-oriented approaches to executing aerial search follows:

(a) *Boundary method.* CSAR forces conduct the operation by first designating the entire search area within the confines of prominent geographical features. The next step is to further reduce the area into subelements also defined by identifiable geographical features. From the larger to the smaller scales, terrain features—such as mountains, rivers, small towns/villages, highways, secondary roads, and natural and man-made objects/obstacles— can be used to piecemeal the operation. The search track will be conducted systematically within the shape of the terrain parameters until the isolated personnel have been acquired or all the subelements of the greater search area have been scanned.

(b) *Grid method.* CSAR forces conduct the operation by designating boundaries and search patterns using eight digit grid coordinates. All elements conducting the search must be using the same series map sheets. If non-CSAR forces are conducting operations in the intended search area, confirmation of like-series map sheets must be accomplished with those

non-CSAR forces. This confirmation will ensure the intended accuracy of any positional/coverage type information passed between the non-CSAR forces and the CSAR task force.

(c) *Track line method*. CSAR forces conduct the operation by planning search routes along what is estimated to be the isolated personnel's ground track from isolation point to extraction point. These search areas will consist of a series of connected rectangular boxes—defined in terms of length and width—initiating at the isolation point and continuing to the planned extraction point.

(d) *Feature trace method*. CSAR forces conduct the operation by searching along specific terrain features estimated to be used by the isolated personnel. The features may include rivers, valleys, roads, etc. Threat lines-of-communication and other potentially high-volume traffic routes should be avoided.

(e) *Automatic direction finding.* Aviation CSAR forces conduct the operation based on azimuths generated from the radio signal of the isolated personnel and the relative heading indicated by radio instruments inside the cockpit. If two or more aircraft are involved in the transmission/reception process, resection plotting can establish a more accurate isolated personnel location.

D-18. ACTIONS ON CONTACT

a. *Authentication.* Authentication of isolated personnel in contact with friendly forces may be initiated several times throughout a CSAR operation. The on-site commander may request authentication, as well as Joint assets and recovering CSAR forces. Authentication procedures with isolated personnel may be electronic or visual, depending on the current situation. A list of authentication procedures/techniques follows:

(1) *Personal identification.* Positive identification of isolated personnel by personnel who know them is the best method of authentication. If possible, CSAR task forces should include at least one person from the isolated personnel's unit to verify identification.

(2) *Isolation preparation packages.* Isolated personnel will have prepared ISOPREPs before their mission. Much of the information in these data sheets (DD Form 1833) is personal in nature and known only to the individual completing them. Isolated personnel should not be requested to transmit the same ISOPREP information more than once during a CSAR operation.

(3) *Code words.* CSAR code words will be provided by the Joint command or the COMARFOR. Code words should be memorized; no copy of these words should accompany personnel into hostile territory.

(4) *Visual signals.* Visual signals may be the only method isolated personnel can use either to identify themselves to friendly forces, or indicate their intentions of other actions. Visual signals must be distinct in contrast to the background

environment.

b. *Security.* Protection of the CSAR task force and the isolated personnel is inherent to the operation. The TTPs employed by the CSAR task force will be the commander's decision. Once the precise location of the isolated personnel has been identified, security of the area must be established. The guidelines for the recovery phase of a CSAR operation are as follows:

(1) ***Spread.*** The CSAR task force commander should ensure that elements of the task force do not mass, encroach upon, overfly, or continuously circle the extraction site. These actions may draw too much attention to a single area. In addition, too many friendly forces in a confined area provide an advantage to relatively small amounts of threat weapon systems/personnel.

(2) ***Extraction/Recovery priorities.*** The CSAR task force commander will execute the extraction of personnel followed by the recovery of equipment. This is true when both personnel and equipment are at the same location. Aircraft extracting personnel (for example, UH-60) should be cleared into the extraction site immediately after the area has been secured. Equipment recovery operations (for example, CH-47D) may be conducted simultaneously with the personnel extraction operation or delayed until the personnel extraction aircraft has egressed the extraction site. In either case, any aircraft ingressing the extraction/recovery site will remain off-station until specifically cleared for the approach by the CSAR task force commander. Conversely, any aircraft egressing the extraction/recovery site will remain at the site until cleared for departure by the CSAR task force commander.

(3) ***360 coverage.*** Forces conducting security should ensure that a ring of protection is formed around the isolated personnel/equipment extraction site. Give special attention to threat vantage points overlooking the extraction site, as well as high-speed avenues of approach.

(4) ***Reporting.*** CSAR task force commanders must never be out of contact with higher headquarters. CSAR task force commanders must alert higher headquarters immediately upon successful/unsuccessful extraction of the isolated personnel. This reporting process alerts the next higher as to the necessity for continued CSAR planning.

Appendix E

Self-Deployment

This appendix serves as a planning guide for aviation units that may be required to self-deploy. The "Army Aviation Deployment for Contingency Operations" planning guide provides detailed guidance for deployment/re-deployment operations. Aviation brigades must be prepared to self-deploy aircraft, personnel, and equipment to almost anyplace in the world. Self-deployment consists either of the unit's moving organic, assigned, and/or attached assets from home station to rail heads, and/or air/sea ports of embarkation—from there, assets will be transported to the theater of operations—or of the unit's moving organic, assigned, and/or attached assets from home station to the theater of operations without rail, air, or sea transport support. Helicopter self-deployment is one of the US Army's most important and unique planning challenges. Units that plan, train, and validate their movement plans will greatly increase their chances of a successful deployment.

E-1. DEPLOYMENT MODES

a. Air lines of communication (ALOC) and sea lanes of communication (SLOC) are both used for helicopter deployment. However, these modes may not have enough assets or time to meet priority needs. AH-64 Apache, UH-60 Black Hawk, and CH-47D Chinook helicopters can carry enough usable fuel to reach a deployable range. Table E-1 shows the characteristics of these aircraft. Figures E-1 through E-3 show proposed extended-range fuel systems for these helicopters. Other helicopters have no extended-range fuel systems; their primary deployment modes are by way of ALOC/SLOC.

b. During the buildup phase of a conflict, the ALOC will be overloaded with high-priority shipments of troops, weapons, and materiel. The SLOC—though not required to transport high-priority cargo—will be tasked heavily to transport outsize and overweight cargo. The longer reaction time required for surface shipping may prevent helicopters from meeting rapid deployment dates.

Table E-1. AH-64, UH-60, and CH-47D characteristics

ELEMENT	AH-64	UH-60	CH-47D
Empty weight (pounds) (dry weight)	10,980	12,500	24,000
Normal internal fuel weight (pounds)	2,442	2,350	6,990
Range on normal fuel (nautical miles) (not including VFR reserve)	360	240	325
Maximum auxiliary fuel weight (pounds)	6,370	3,100	15,776

Maximum ferry range (nautical miles) (not including VFR reserve)	1,089	540	1,056
Gross weight for maximum range (pounds)	21,065	22,000	50,000
Average true airspeed (knots)	124	118	130
Mission time (hours)	8.5	5.0	8.0

FOUR 230-GALLON
EXTENDED-RANGE
FUEL TANKS

POSITION LIGHT
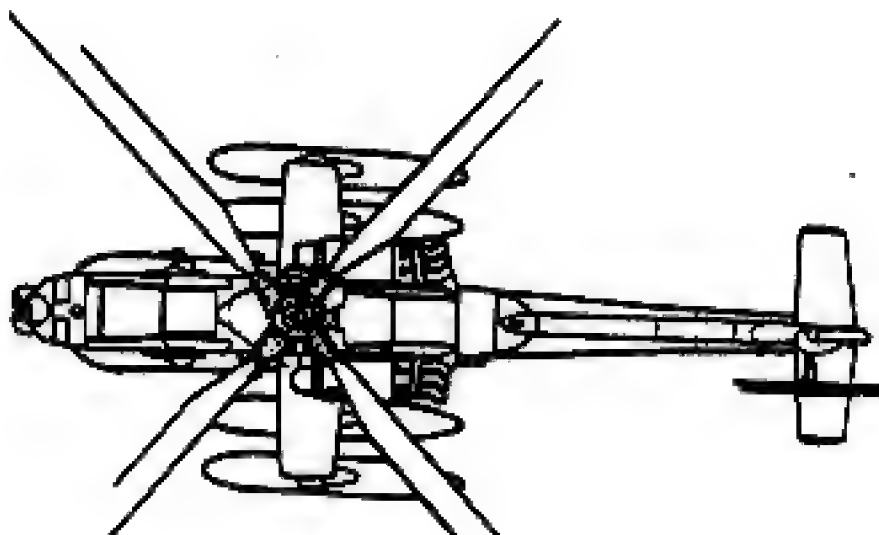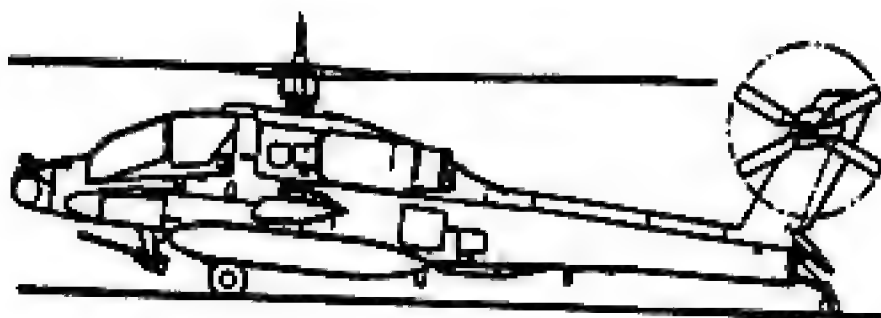
Figure E-1. AH-64 extended-range fuel system

RIGHT OUTBOARD
VERTICAL STORES
PYLON (SAME
BOTH SIDES)

HORIZONTAL
STORES SUPPORT

POSITION
LIGHT

230-GALLON
EXTENDED-RANGE
FUEL TANK

450-GALLON
EXTENDED-RANGE
FUEL TANK

GENERAL ARRANGEMENT (ESSS)
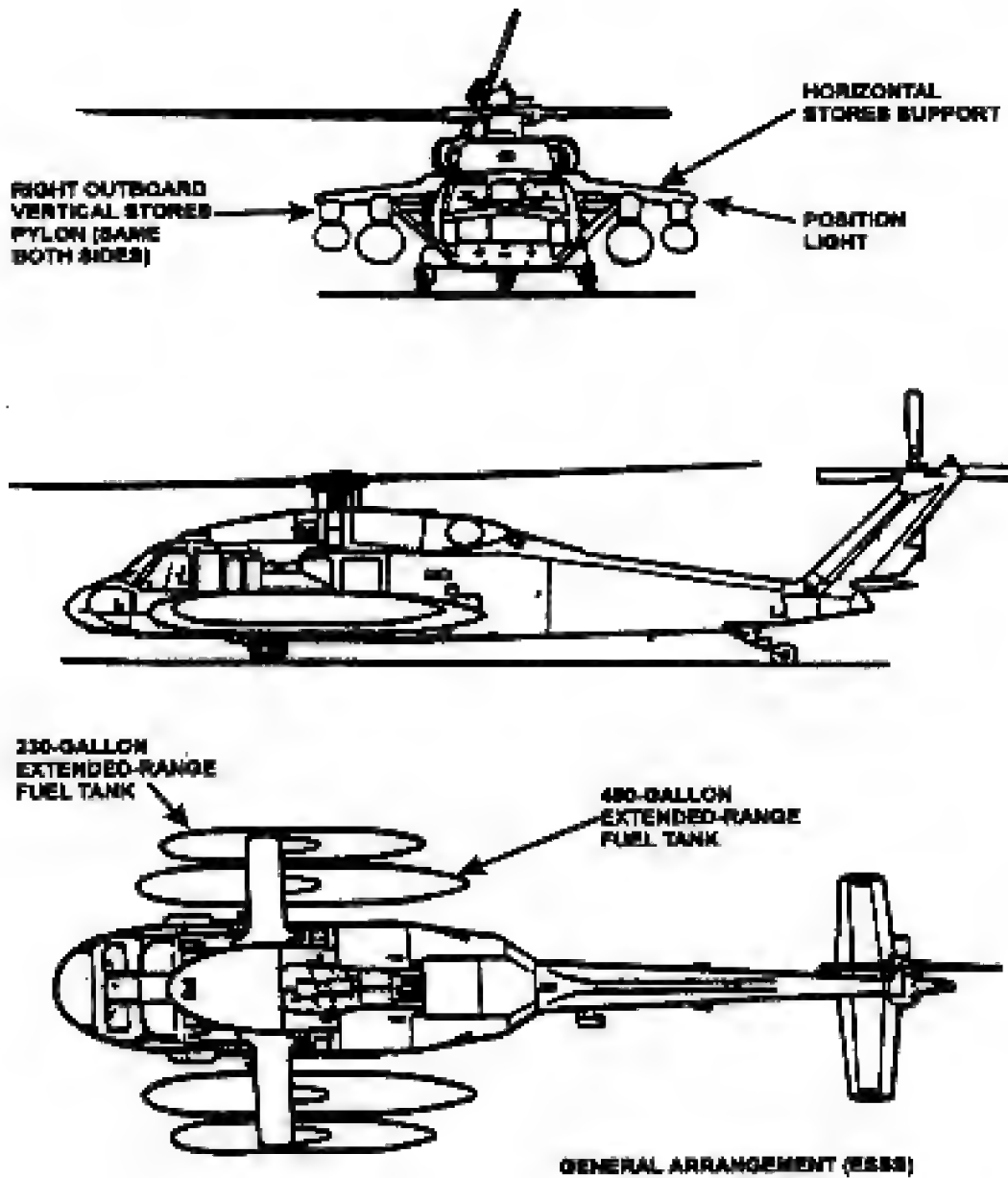
Figure E-2. UH-60 extended-range fuel system
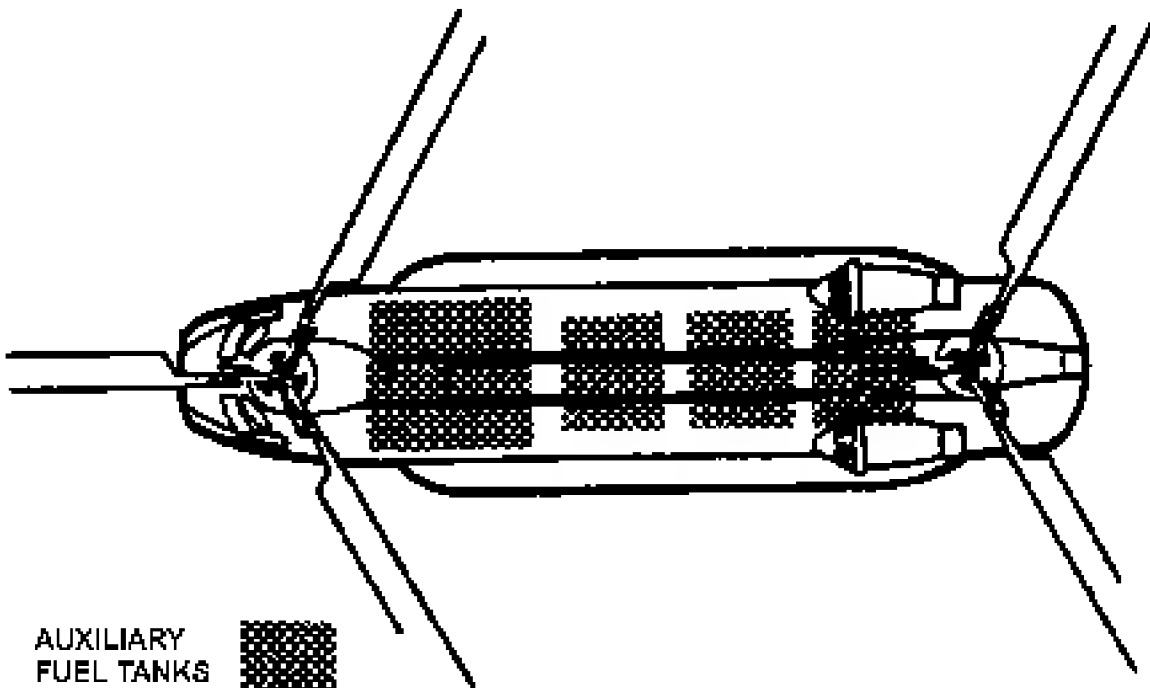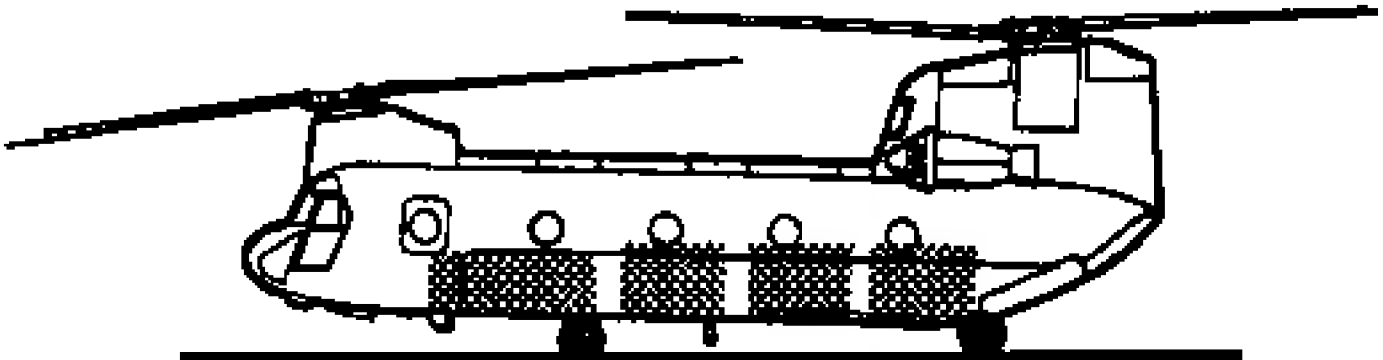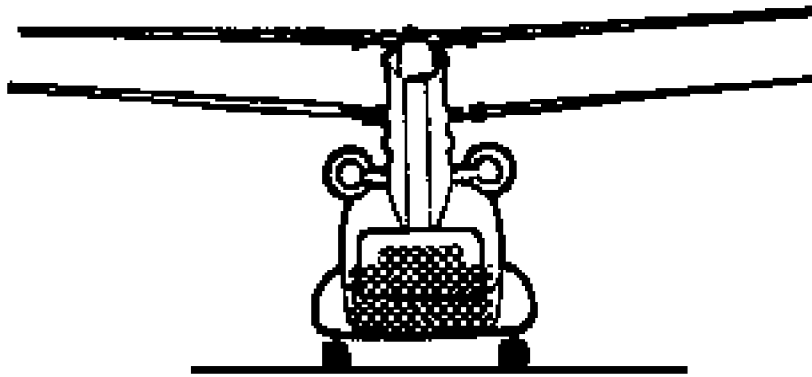
**AUXILIARY
FUEL TANKS**

Figure E-3. CH-47D extended range fuel system

E-2. DEPLOYMENT FUNDAMENTALS

a. Aviation brigade units receive the directive to execute deployment operations. They then ferry their aircraft using preselected routes to departure points. The preselected routes are included in the units' deployment operational plans (OPLANs). The departure points are operated by units that can perform depot-level maintenance. Deploying units arrive at the departure points according to the established sequence for force deployment or as otherwise directed. As the units arrive, a dedicated depot support team prepares the aircraft for deployment. Preparation includes required aircraft maintenance and installation of ferry equipment. Concurrently, the deployed element is integrated with its aerial support team. Then the deploying unit is prepared to depart.

b. The deployment execution directive may dispatch predesignated ground support teams to stopover points along self-deployment flight routes.The ground support teams include personnel, equipment, and repair parts to provide limited services. These services include maintenance; petroleum, oils, and lubricants (POL); supply; medical; communications; weather forecasting; flight planning; and housekeeping. To save time, units pre-position some of the required equipment and repair parts at stopover points.

c. Predesignated aerial support teams provide en route assistance and expertise to the self-deploying aircrews. These teams consist of two ferry- and rescue-qualified aviators who are familiar with the proposed route. The team members fly as pilots in command in both the lead and trail aircraft of the deploying flight. Aerial support teams may be organic to a depot and composed of Active Army and Reserve Component aviators.

d. Deployment flights terminate at depot or aviation intermediate maintenance (AVIM) facilities in the theater. Personnel at these facilities remove ferry equipment, install combat mission equipment, and perform required maintenance and inspections to prepare the aircraft for combat. They also coordinate the immediate backhaul of predesignated aerial support teams and ferry equipment. Like aerial support teams, AVIM facility personnel are preselected and dispatched when the deployment directive is issued. Most of the required equipment is prepositioned in the same way as the en route ground support equipment. To facilitate the integration of deploying aircraft and crews into a theater combat force structure, command facilities must be located at each termination site.

e. When aviation brigade units are deployed to destinations beyond those with fixed-base facilities, predesignated ground support teams are positioned to perform those functions described in **b** above. If ground support teams are not available or cannot be emplaced, coordination may be conducted with friendly nations to provide the required services.

E-3. RESPONSIBILITIES

a. *Commander.* The commander is responsible for the movement of his unit's personnel and equipment. Therefore, he reviews and validates SOPs and movement and load plans. The commander supervises the operation of subordinate units and coordinates with other headquarters for technical data and logistics support. He establishes policies for air lines and sea lanes of communication and ensures that personnel comply with directives, policies, and regulations. The commander also directs the safety and accident prevention program so that self-deployment operations are conducted safely. (Appendix B describes risk management.)

b. *Personnel (S1/G1).* The S1/G1 is responsible for unit-strength maintenance and personnel service support. He ensures that personnel in deploying units and support teams are qualified to perform the mission. The S1/G1 manages the safety and accident prevention program planned and implemented by the aviation safety officer. He implements a plan to care for nondeployable personnel and family members of deploying personnel.

c. *Intelligence (S2/G2).* The S2/G2 is responsible for self-deployment intelligence operations. He prepares the intelligence estimate for the self-deployment operation. Staff officers use the intelligence estimate to determine how the threat will affect their areas of responsibility. The S2/G2 is responsible for the IPB. The IPB provides detailed information about the threat, weather, and deployment routes. The S2/G2 provides deploying aircrews with USAF long-range weather forecasting information as well as counterintelligence estimates. He also plans and supervises implementation of counterintelligence measures to support the operation. These measures include the counterintelligence aspects of deception to support C^3 countermeasures.

d. *Operations and Plans (S3/G3).* The S3/G3 prepares the OPLAN and contingency plans. These plans are implemented when the order is received to self-deploy aircraft or to support a deploying unit. The S3/G3 task-organizes and trains the unit to meet the requirements of the OPLAN and contingency plans. The S3/G3 of a self-deploying unit plans and conducts the deployment of the remainder of his unit with available resources. He then plans the assembly of these two separate segments of his unit and prepares them for entry into the theater as a combat-ready unit. The S3/G3 of the supporting unit coordinates the redeployment of aerial support teams and equipment identified for immediate return.

e. *Logistics (S4/G4).* The S4/G4 of both the self-deploying unit and the supporting unit are responsible for logistics requirements along the self-deployment route. They coordinate closely with each other and the aviation maintenance officers. The S4/G4 determines what is already pre-positioned at intermediate sites and what should be deployed to them. The supporting unit's S4/G4 coordinates the deployment of support teams and equipment to their respective sites. The self-deploying S4/G4 is involved in deploying the remainder of his unit. Aviation maintenance officers organize a maintenance support operation to prepare aircraft for self-deployment and to meet scheduled and unscheduled maintenance requirements along the route.

f. *Civil-Military Affairs (G5).* The G5 of the self-deploying unit assists the staffs of both

self-deploying and supporting units. He requests and coordinates maintenance and crew rest facilities, fuel, and messing for stopover-point teams and self-deploying aircrews. The G5 is the point of contact for staff officers who deal with host nations.

g. *Unit Movement Personnel.* Unit movement personnel develop SOPs and movement and load plans. They train unit movement personnel and ensure that personnel and equipment are prepared for the move. Unit movement personnel inspect and inventory equipment before and after the unit moves. They also ensure that appropriate support and logistics requirements are requested.

E-4. COMMAND CONSIDERATIONS

a. The command structure must be able to integrate their self-deploying assets into the theater. Thus, aviation assets will be available and effective in the AO.

b. Planning is an important aspect of self-deployment. The following is a list of important planning and operational considerations.

(1) *Planning Considerations.*

(a) Diplomatic clearances for overflight and landing are required for every country along the route of flight. Consult the foreign clearance guide for specific requirements of each country. Alternate routes are required if one or more countries refuse to grant diplomatic clearances.

(b) Passport and visa requirements are verified for each country of intended landing. Passports are recommended for all crewmembers and accompanying personnel.

(c) Crew selection should be carefully considered and have the aviation commander's personal involvement.

(d) Each departing flight of multiple aircraft should be self-sustaining in terms of food, water, limited maintenance capability, survival equipment, and force protection. To do this may require that UH-60s or CH-47s be task organized with AH-64s to enhance the self-sustainment capability of the AH-64s.

(e) Crewmembers or other support personnel with specific foreign language proficiency may be required for those countries in which refueling or remain over night (RON) stops are planned.

(f) Short- and long-range weather forecasts are provided by USAF weather personnel.

(g) Frequencies for internal flight following throughout the trip must be coordinated.

(h) Host nation support requirements are requested through the applicable defense attache offices (DAOs) or military groups (MILGROUPs).

(i) Transportation, meals, lodging, security, and fuel are planned for each intended RON site. Advance party personnel may be sent to each site along the route of flight to coordinate these requirements with the DAO.

(j) Although only those aircraft with extended range fuel capabilities participate in self-deployments (UH-60, CH-47, AH-64), en route fuel stops are necessary. The availability and quantity of on-site fuel is verified telephonically rather than simply referring to Department of Defense Flight Information Publication (DOD FLIP) manuals. Fuel quality is verified at each location before pumping it into aircraft fuel tanks.

(k) Self-deploying aircraft cannot deploy combat troops. The limited space in each aircraft is used to accommodate those supplies, tools, parts, survival equipment, and limited support personnel necessary to make the flights self-sustaining until arrival in the theater of operations.

(l) A pre-accident contingency plan is developed before executing the self-deployment. Available medical facilities along the route of flight are identified.

(m) A contracting officer and/or Class A agent may be required at stopover sites. If so, include them in the advance party(s).

(2) *Operational Considerations.*

(a) The aviation brigade/battalion/squadron S2 obtains threat intelligence information about those countries that are overflown and those where landings are planned. Terrorist threats, counterintelligence, and specific force protection concerns are important to aircrews for planned, as well as unplanned en route stops.

(b) Route planning takes into account environmental considerations such as high altitude, mountainous and jungle terrain, and overwater flight. Required crew training and special equipment for each of these environments is included.

(c) Navigational radios and maps appropriate for the route of flight are made available for each aircraft in each flight.

(d) If extensive legs of flight are over water, a risk analysis is conducted and alternatives considered.

(e) Individual and crew-served weapons remain out of sight during flight and ground operations. At RON locations, the DAO can arrange for aircraft security overnight. He can also provide assistance in security of small arms and other sensitive items.

(f) Survival gear, to include survival vests (personnel may want to include foreign currencies), rafts, hot/cold survival kits, rescue hoist, survival radios,

food, and water are essential mission equipment for the self-deployment.

(g) Deploying personnel must know how to use all aviation life support equipment (ALSE) and any other special equipment that is taken, such as the rescue hoist. One, preferably two aircraft per flight are outfitted with a rescue hoist.

(h) Maintenance personnel—to include a maintenance test pilot (MTP)—are included in the flights themselves or pre-positioned at various planned stopover locations. Procedures for scheduled/unscheduled maintenance requirements, facilities, and aircraft recovery are included.

(i) A maintenance support package includes an external stores support system (ESSS) tank rack; tow bars; packaged POL; limited spare parts; a mechanic's toolbox; and tug or tow vehicle.

(j) Satellite communications (SATCOM) are taken if available. This enables each flight to communicate its status to home station and in the theater of operations.

(k) Procedures for handling a downed aircraft, conducting combat search and rescue (CSAR), and aircraft recovery are planned in advance.

(l) Air defense identification zone (ADIZ) procedures, as well as international interception signals, must be clearly understood by all aircrew members.

(m) International clearances must be approved before departure and understood by all aircrew members.

(n) Rules of engagement (ROE) are specified when carrying weapons and ammunition.

E-5. RECEPTION, STAGING, ONWARD MOVEMENT, AND INTEGRATION

Reception, staging, onward movement, and integration (RSOI) is defined as a phase of force projection occurring in the AO. It is the essential process that transitions arriving personnel and materiel into forces capable of meeting operational requirements. FM 100-5 Draft (4 April 1997) has a detailed discussion of RSOI. However, this paragraph focuses on aviation-specific considerations:

a. *Reconfigure.* Reconfiguring entails task organizing. Then it includes prioritizing the effort of CSS assets to build the combat-capable units and C^{3}I architecture so they are needed based on the mission, task organization, and possible threats. For aviation units this requires movement planners, logisticians, and maintenance personnel to carefully wargame the arrival of units and equipment into a theater.

b. *Protect the force.* All other considerations are subordinate to this requirement. Two equally important elements must be considered. They are discussed below.

(1) *Self-protection.* Aviation forces deploying into a theater are particularly

vulnerable during the buildup phase when the unit is not at full strength or the aircraft are not fully assembled. The security plan must be understood and executed from the moment the first unit personnel arrive. This plan should include those measures both passive and active to combat any air and ground threats. Fratricide also is possible so theater-specific identification friend or foe (IFF) procedures must be briefed and understood by all deploying crewmembers.

(2) **Force protection.** Because of Army aviation's inherent deployability, versatility, maneuverability, and lethality, aviation forces often will be among the first units brought into theater. In fact, aviation units may have to provide reconnaissance, security, and attack operations to secure a lodgment before any forces land in theater. This forces the aviation brigade or task force (TF) to conduct continuous operations from an off-shore or remote location, while it's main body moves into the lodgement area. Fratricide can occur on the ground as well so all flight crewmembers must understand the the composition and location of friendly forces and the ground maneuver plan.

c. **Build Combat Capability.** Aviation units will execute this requirement by linking combat-ready personnel with their equipment. They must also interface with theater CSS units to ensure all supply and maintenance functions are operational and coordinated.

d. **Train.** The aviation training requirements will vary greatly from theater to theater; however, those generic items —i.e., theater specific ROE; status of forces agreement (SOFA) provisions; local customs; language training, and operational security (OPSEC) requirements) that can be anticipated should be performed at home station, if possible. Local area orientations, test flights, or other requirements that cannot be executed in advance may be required. If so, commanders should attempt to task organize at the lowest levels to allow test pilots, instructor pilots, and key leaders to front load some of these requirements before the entire unit arrives. The advance party should be briefed on these requirements and the plan for their execution so they can identify and coordinate any external support those key personnel will need to execute the plan when they arrive.

e. **Acclimate to the Environment.** Acclimation starts before deployment and continues until redeployment. Before deployment the aviation unit should issue the appropriate survival equipment and clothing for the climate that will be encountered. Most deployments will involve operating in a joint or multinational environment. Aviation units may be able to schedule training with other joint players or even professional development classes taught by instructors from other services. If so, this training could only help with the acclimation process.

f. **Assisting Forward-Presence or Host-Nation Forces.** Cavalry and attack units probably would meet this requirement through security missions or shows of force. Lift units can meet it by delivering supplies to friendly forces already in theater.

Appendix F

Stability and Support Operations

This appendix applies stability and support operations (SASO) doctrine to aviation brigade commanders, their staffs, and brigade operations. The primary focus of Army aviation is warfighting. However, aviation brigades possess capabilities that apply to peace, conflict, and war; therefore, aviation units may be directed to deploy and conduct SASO. FM 100-5, FM 100-19, and FM 100-20 are the Army's primary doctrinal references for SASO.

F-1. PERSPECTIVE

a. The Army classifies service activities during *peacetime* and *conflict* as SASO. *Peacetime* activities can occur either in continental United States (CONUS) or outside CONUS (OCONUS) environments. Examples of peacetime activities include—

- Disaster relief.
- Humanitarian assistance.
- Counterdrug operations.
- Support to law enforcement.
- Military training exchanges.
- Multinational exercises.

b. *Conflict* can also occur in both CONUS and OCONUS environments. Examples of operations in conflict are—

- Limited attacks.
- Raids.
- Base defense.
- Shows of force.
- Support to insurgencies and counterinsurgencies.
- Peacekeeping.
- Peace enforcement.

c. In SASO, Army aviation units conduct combat, CS, and CSS missions. No new Army aviation missions have developed as a result of SASO. There is, nevertheless, a requirement for aviation units to train to the conditions under which they will operate. Therefore, aviation brigade commanders must obtain as much information as possible about the conditions surrounding the SASO; they must adapt training programs to meet mission requirements. Examples of different type conditions may include—

- Weather.
- Terrain.
- Command and control (C^2) relationships.
- Rules of engagement (ROE).

F-2. OPERATIONAL CONCEPT

a. SASO may require the deployment of the entire aviation brigade or only elements of the brigade. The C^2 headquarters normally is a function of the size of the aviation deployment package. The aviation unit/element may be designated as the C^2 element for additional forces. Further, it may be attached to another headquarters for operational purposes. These higher headquarters may include another brigade/division/corps headquarters, an Army Forces (ARFOR) headquarters, or a joint task force (JTF) headquarters.

b. Frequently, SASO focus on missions that require the efforts of combat support (CS) and combat service support (CSS) units. Because of the attention the missions listed below receive during SASO, CS and CSS units frequently will be the *main effort*; combat units become the *supporting effort.* These units work with US and foreign civilian agencies of government, international organizations, and private organizations. Examples of US Army aviation SASO CS/CSS operations include—

- Transportation of domestic and foreign civilian/military personnel.
- Transportation of equipment, food, water, medical supplies, and other life-sustaining materials.
- Provision of limited technical/logistical support to non-US military personnel and equipment as directed.

F-3. SASO PRINCIPLES

a. Army aviation doctrine has long been based on well-established principles of war. SASO also have principles that guide the commander's actions. The relative application of each principle varies, depending on the specific operation. Aviation brigade commanders must understand the implications of these principles by virtue of the fact that they may be designated as task force commanders in an SASO. The SASO principles are as follows:

(1) *Objective.* Direct every military operation toward a clearly defined, decisive, and attainable objective.

(2) *Unity of effort.* Seek unity of effort toward every objective.

(3) *Legitimacy.* Sustain the willing acceptance by the people of the right of the government to govern or of a group or agency to make and carry out decisions.

(4) *Perseverance.* Prepare for the measured, protected application of military capability in support of strategic aims.

(5) *Restraint.* Apply appropriate military capability prudently.

(6) *Security.* Never permit hostile factions to acquire an unexpected advantage.

b. FM 1-100, FM 71-100, FM 100-5, and FM 100-20 further expand on the principles of SASO.

F-4. PLANNING CONSIDERATIONS

Once tasked to execute SASO, the aviation brigade commander initiates the planning process. This planning process continues throughout the entire mission. Listed below are factors that will help in planning SASO.

a. *Mission Analysis.*

(1) The brigade staff receives the OPLAN/OPORD from the next higher headquarters. The staff then analyzes the mission relative to appropriate theater strategy, campaign plans, and concept plans (CONPLANS).

(2) The theater strategy, if available, articulates the commander-in-chief's vision for the theater. It provides guidance, direction, and opportunities for peacetime activities in general terms of ends, ways, and means. Campaign plans and CONPLANS identify theater objectives, sustainment concepts, needed resources, and specified and implied tasks. Supporting plans developed by headquarters above the aviation brigade level provide more definitive guidance on essential tasks.

(3) The aviation brigade commander should be able to—

(a) Articulate the aviation brigade's mission to subordinate commanders.

(b) Define all specified and implied tasks.

(c) State what the current end-state of the mission is perceived to be.

(4) The aviation brigade commander should plan for at least a 6-month rotation for any SASO despite what the current mission-duration is forecast to be.

b. *Task Organization.* Task organization is METT-T dependent; often it is modified by political considerations. The aviation brigade commander—

(1) Is the one best able to determine aviation-peculiar mission requirements as the division/corps aviation officer.

(2) Must assess the brigade's organizational assets and any expected attached assets for the mission.

(3) Must determine if the task force is equipped to meet all the specified and implied tasks of the mission.

(4) Must take part in the initial development of all OPLANs/OPORDs relative to the mission.

c. *Command and Control Relationships.*

(1) The aviation brigade—or elements of the aviation brigade—may not deploy with the next higher headquarters; therefore, C^2 relationships must be established early on. In certain circumstances, elements of the brigade may be placed under OPCON

of another US agency. Specific date/time groups for C^2 transfer should be requested if not provided by higher headquarters.

(2) A clear understanding of the C^2 relationship will help reduce confusion throughout the entire preparation and deployment phases of the operation. In addition, units designated for attachment to the aviation brigade must clearly understand the date/time when C^2 transfers from their owning headquarters to the aviation brigade or an element of the aviation brigade.

d. *Advance Party Operations.* Advance party personnel need to—

(1) Have a comprehensive overview of their unit's mission.

(2) Fully understand the intent of their commander and the gaining commander.

(3) As aviation brigade representatives, see and understand every facet of the operation.

(4) Be prepared to be the conduits for information flow between the gaining command and home station.

(5) Be prepared to receive and understand instructions/guidance from the gaining command.

(6) Transmit this critical information back to the home station commander.

(7) Be prepared to request/coordinate with the gaining command that which is necessary to ensure a smooth and orderly inflow of personnel and equipment.

(8) Be prepared to provide/receive information on the following subjects:

(a) *Unit deployment status.* Upon arrival in the deployment AO, the most important information to the gaining command may be the deployment status of the inbound unit. Advance party personnel must be prepared to—

- Brief the most recent update on scheduled arrival times for supporting Air Mobility Command (AMC) assets; if the unit is self-deploying, the planned arrival date/time.
- Update and brief the inbound unit's task organization structure and priority of transport as necessary.

(b) *US military/Host nation in-processing procedures.* US military or host nation administrative procedures may require the arriving units to in-process at the port of debarkation.

<u>1</u> This in-processing may include—

- Passport/military identification checks.
- Medical records check and/or transfer.
- In-country briefings (local customs, consumable items, currency exchange, legal/illegal procedures, off-limits areas, and

environmental conditions).

2 Advance party personnel should advise their units if this process is impending upon arrival. In addition, prior coordination must be conducted at the deployment site/port of debarkation to facilitate an orderly flow of personnel/equipment into the AO.

(c) *Helicopter staging area.* Helicopters arriving by AMC support will need to be reconfigured for mission capability after off-loading. Advance party personnel should request ramp space with easy maintenance vehicle/equipment accessibility. Maintenance test flight airspace for the post reconfiguration phase also must be requested/coordinated through the appropriate authorities.

(d) *Petroleum, oils, and lubricants.* POL needs to be coordinated in synchronization with aircraft/ground vehicle arrival at the sea port of debarkation (SPOD)/air port of debarkation (APOD). Also fuel resupply either at the operating base or forward operating base needs to be planned and coordinated. Advance party personnel need to know—

- Types of fuel available upon aircraft arrival.
- Aircraft specific fuel load capabilities.
- Fuel nozzle requirements.
- POL handling procedures in the staging area and deployment site(s).

(e) *Maintenance.* Advance party personnel need to know what the status of AO Class IX repair parts will be on the deploying units arrival date. This information may help the deploying commander as far as the transportation of certain aircraft within the unit. The deploying commander may need to know what facilities will be available upon the arrival of the unit.

(f) *Life support/Billeting.* Incoming personnel arrival numbers may exceed, or be expected to exceed, Class I stockage previously shipped by the unit. If so, Class I iterms may have to be requested/coordinated. Billeting space must be coordinated for the arriving elements. Within an AO, advance party personnel may have to request/coordinate—

- Tentage.
- Open bays.
- Barracks or occupied urban/suburban sections.
- Class II items at this time along with increased engineer support.

(g) *Radio frequencies/Flight following procedures.* Advance party personnel need to—

- Coordinate with the personnel (civilian or military) responsible for authorizing radio frequency usage.
- Brief gaining command operations personnel on intended use of

administrative and tactical frequencies.

- Check for frequency confliction and deconflict as necessary.
- Coordinate with the airspace C^2 cell at the required echelon for flight following—both positive and procedural—and request airspace as necessary.

(h) ***Forward operating base (FOB) coordination.*** The aviation unit may be tasked to occupy an FOB. If so, advance party personnel must—if at all possible—conduct reconnaissance operations; they specifically should consider—

- Ground route security from the initial staging base (ISB) to the FOB.
- Aircraft parking.
- Tactical operations center (TOC) locations.
- Environmental conditions.
- Aircraft/ground vehicle maintenance areas.
- Ammunition storage sites.
- Forward arming and refueling point (FARP) locations.
- Ground vehicle accessibility in and around the area.

e. ***Split-Based Operations.*** The full integration of supply and transportation functions into a vertical distribution system is critical. Logistics management functions may be conducted from the deploying unit's home station theater. Only those functions critical to the operation are conducted in the deployment AO. This is called split-based operations. These type operations call for elements of the materiel management center (MMC) to remain at home theater locations; force-projection cells deploy to an AO with the force they support. The deployed MMC cells consist of personnel and equipment in modular components. These components provide a conduit for electronic transmission of logistics data. The rear MMC continues to support the stay-behind force; at the same time, it interfaces with the forward-deployed cells. Split-based operations apply to all logistics functions. The aviation brigade commander assesses the capabilities and assets of the logistics support network; he then provides input at both the planning and execution phases, as needed, to assure the mission is accomplished.

f. ***Deployment.*** SASO deployments deserve special consideration. (SeeApp E, this manual, and the Army Aviation Deployment for Contingency Operations planning guide.) Many times the aviation brigade,or elements of the aviation brigade, will deploy alone—not as part of a larger division/corps operation.

(1) Therefore, the aviation brigade commander must ensure that—

(a) The deploying unit(s) continue to receive the division/corps level of attention needed to facilitate a smooth deployment process.

(b) The deploying unit(s) are fully supported during their preparation for deployment and deployment phases.

(2) Examples of when the aviation brigade commander can influence this type support include—

(a) Reduction/elimination of external taskings once the unit has been tasked to conduct the SASO.

(b) Increased maintenance support to bolster aircraft and ground vehicle operational readiness (OR) rates.

(c) Additional personnel support for low-quantity military occupational specialties (MOSs) fills either for the deploying elements, the rear elements, or both.

g. *Lines of communication (LOCs).* LOCs are all the routes—land, water, and air—that connect an operating military force with a base of operations along which supplies and military forces move. Maintaining uninterrupted logistics support throughout all phases of an operation is the central challenge of logistics. The aviation brigade commander must view logistics as an implied task from operation-start to operation-finish. He specifically should consider aviation LOCs to include—

(1) En route POL (if self-deploying).

(2) En route and deployment AO communications with home station.

(3) Prepositioned Class I, III, and V in the deployment AO upon arrival.

(4) Technical support en route and in the deployment AO upon arrival.

(5) Security at debarkation sites and along routes to FOBs.

h. *Force Integration.* The aviation brigade commander—

(1) Can expect the brigade—or elements of the brigade—to conduct SASO in joint, multinational, and separate agency—government and nongovernment—type environments.

(2) Should be aware of several operational considerations as aviation brigade forces prepare to execute SASO:

(a) First, the airspace C^2 structure probably will be based on joint procedures modified to host nation constraints. This may result in positive and/or procedural control changes; it may require relatively quick adaptation on the part of US Army aviators.

(b) Second, all US and non-US personnel must understand procedures for operating in and around US Army aircraft. Reciprocally, all US military personnel must understand procedures for operations around multinational ground and aviation forces. Authorizations allowing transportation of non-US military personnel need to be coordinated before AO arrival. In addition, pre-flight passenger briefings need to be comprehensive and standardized.

(c) Third, an Army aircraft tasking procedure needs to be set in place as soon as possible. Preferably, it should be set in place before the arrival of the aviation main body. This probably will be a higher level staff function; however, it will be critical to initiation of operations early in the mission.

i. *Force Protection.* The aviation brigade must consider force protection as an implied task throughout the operation. External security assets must be task organized with the brigade (or elements of the brigade) before deployment or attached immediately upon arrival at the AO. Ground security should include routes between the aviation FOB and all related LOCs. The size of the ground security force depends on many variables. Some of these include—

(1) The isolation or remoteness of the aviation assembly area at the FOB.

(2) An enemy situation.

(3) Any terrorist activities.

(4) The civilian attitude towards US military presence in the area.

(5) A friendly force situation.

j. *Rules of Engagement (ROE).* ROE are designed to control the application of force. These rules stipulate under what conditions US soldiers can defend against, or attack, an existing threat. Normally, the ROE are restrictive. The ROE will be prepared and issued by a higher headquarters before any of the aviation brigade elements deploy to the AO. The aviation brigade commander—

(1) Must clearly understand the ROE—specifically in the light of aviation operations.

(2) Must be prepared for ROE to change at any time during an operation.

(3) Must brief all ground and aircrew personnel on the ROE again upon arrival at the port of debarkation/ISB.

(4) Should consult with the brigade staff judge advocate (SJA) representative and/or the corps/division SJA for ROE assistance.

(5) Should plan for an SJA representative to deploy with the force.

k. *Liaison Activities.* Higher echelon mission requirements may require the assignment of aviation liaison personnel to higher/adjacent headquarters as well as international and foreign government organizations. Therefore, the aviation brigade commander—

(1) Must be prepared to release personnel for these functions. (This may require him to request augmentation to support this expanded liaison requirement.)

(2) Should *plan* to attach at least one liaison officer to each higher level Army component headquarters within the larger task force to prevent subsequent shortfalls or gaps within the unit. (These officers should be able to discuss the doctrinal aspects of Army aviation, operations, and logistical support.)

(3) Reciprocally, should request liaison support from all elements (US and foreign) that may affect accomplishing the unit's mission. (Liaison officers should deploy with their own transportation and communications assets.)

l. *Host Nation Considerations.*

(1) The following procedures/restrictions can vary in every country in the world:

- Civil and military laws.
- Airspace restrictions.
- Radio frequency usage.
- Ground convoy clearances.
- Aircraft operating time restrictions.
- Flight clearances.
- Refueling procedures.
- Product disposal procedures.

(2) The aviation brigade commander must be prepared to adapt the unit to the host nation operating environment. Serious problems/complications can develop when host nation requirements are not being met by the force; they can result in further restrictions or even mission failure.

m. *Redeployment.*

(1) During SASO, local/national forces operating in the AO may, or may not be, pro-US military presence. The presence of US military forces may be perceived as a stabilizing factor. Moreover, friendly local/national forces may see the departure of US military forces as not being in their best interest. To show the need for continued US military force presence, pro-US factions may increase hostile actions against an identified threat.

(2) Therefore, the aviation brigade commander—

(a) May expect an increase in hostilities between pro-US factions and anti-US factions as announcements—formal or informal—are circulated about the departure of US forces.

(b) Should enact a heightened level of security during these times.

Appendix G

Deep Operations

This appendix gives an overview of deep operations to include scheme of maneuver and planning. It outlines 10 steps generally required to execute a deep attack with attack helicopters and provides a [deep planning checklist](#). It maintains continuity with other capstone Army doctrine; therefore, it refers to the traditional battlefield framework of close, deep, and rear. This traditional battlefield framework will become increasingly convoluted and ambiguous; the future battlespace will be fluid, high tempo, and nonlinear. In the near future, a more viable framework may be simply close and extended operations. On the nonlinear, noncontiguous battlefield of the future, aviation forces must be prepared to conduct seamless, simultaneous operations in all directions. Thus, the spacial constructs of the future battlefield may change. However, the mainstay of tactics, techniques, and procedures (TTPs) at brigade level and below—discussed in this appendix—remains valid. This is true whether the TTPs are employed in today's deep operations or the extended operations of the 21st century.

G–1. DEEP OPERATIONS OVERVIEW

Deep operations must be based on careful analysis of the enemy's potential to interfere with current and planned operations. Normally, only those enemy forces that threaten friendly operations are relevant. Priority should be given to those targets vulnerable to interdiction that are most critical to the enemy's operations. A thorough intelligence preparation of the battlefield (IPB) and timely intelligence from supporting sources can identify targets that—when destroyed, damaged, or neutralized—most impede the enemy's ability to concentrate forces, control operations, or support the operation at critical times.

a. The corps aviation brigade is one of the corps commander's main instruments for projecting combat power in the deep operations area. The corps commander can seize the initiative and create opportunities for offensive exploitation. He accomplishes this by timely and aggressive incursions against enemy second–echelon forces; command, control, and communications (C^3) nodes; and critical combat service support (CSS) operations. Whether the corps is in a defensive or an offensive posture, deep operations are planned and executed continuously as a part of the corps scheme of maneuver. Corps aviation forces focus mainly on deep operations during darkness; division aviation forces focus mainly on close and rear operations.

b. Corps attack helicopter battalions—as well as their divisional counterparts—attack and wear down enemy combat and combat support (CS) forces. Deep operations for corps aviation assets focus chiefly on reserves, exploitation forces, and long–range artillery of the first operational echelon. Corps aviation brigades often operate independently or as a pure aviation force in deep operations. The corps aviation brigade may interdict second– and, possibly, third–echelon divisions of the first–echelon army or first–echelon elements of the second–echelon army. With corps aviation forces, the corps commander may want to stop the enemy from introducing additional combat and CS forces into the corps area of operations (AO). Specific objectives may include—

    (1) Limiting the enemy's freedom of action.

    (2) Altering the tempo of operations in favor of the division and corps.

(3) Denying the enemy the ability to concentrate forces.

(4) Isolating close operations on advantageous terms (set the terms of battle) by—

(a) Reducing the closure rates of uncommitted forces.

(b) Preventing introduction of additional combat and CSS forces within an AO.

(c) Delaying, disrupting, diverting, or destroying forces and activities within an AO.

c. Corps aviation brigades also may conduct air assault operations. With ground maneuver units, assault and medium helicopter units can assist in securing deep objectives. Medium helicopter and command aviation assets also provide CS; CSS; and command, control, communications, and intelligence (C^3I) enhancement.

G–2. SCHEME OF MANEUVER

Deep employment requires timely intelligence, effective command and control (C^2), responsive CSS, and combined arms execution. It is characterized by flexibility, speed, surprise, and shock action. Therefore, corps aviation units must have direct access to deep intelligence–gathering sources. During deep operations, the corps aviation brigade conducts missions to support the commander's overall scheme of maneuver—defensive or offensive.

a. Defense. In defensive maneuvers, deep operations should disrupt the enemy's time–sequencing of follow–on echelons and sever lines of communication. To support the corps defensive scheme of maneuver, aviation brigade forces conduct offensive operations such as attacks by attack helicopter groups. These attacks may disrupt, delay, and destroy enemy follow–on forces and their logistic operations. Corps attack forces often take part in these attacks as part of combined arms operations to seize or destroy critical objectives.

(1) Detailed IPB is critical to this operation. IPB products allow the commander to track the movement of the independent tank regiment (ITR). Thus, he can synchronize the entire effort to deliver the maximum effect on the enemy at the most effective point on the battlefield. Such a point would offer long–range fires for attacking aircraft while constraining the enemy force to the engagement area (EA).

(2) Time for detailed planning is essential for deep operations. The main planning consideration is the timing required to catch a moving enemy force in the EA. Intelligence assets must be focused early and sufficient planning performed or the deep operation may be ineffective. Therefore, a reverse–planning sequence is used. While no set time interval is established for warning, preplanned actions will be more effective than short–notice reactions to enemy initiatives. The key is a close and continuous watch on the battlefield in depth and an accurate assessment of probable enemy actions.

(3) Early notice is required to obtain US Air Force (USAF) resources for suppression of enemy air defenses (SEAD) or objective area operations; thus, preplanned sorties are armed and prepared. When enemy helicopters threaten the force, screen operations may be planned and conducted. These screens must be distant enough from the main body of the group to allow time for counteraction or response. Night operations offer more protection to the force; however, they make navigation and adverse weather avoidance more difficult.

b. Offense. During initial attacks in offensive campaigns, aggressive actions in deep operations—such as destroying tactical reserves, logistic centers, and CS systems—can reinforce success in close operations. Then as the offensive operation develops, deep operation efforts can block withdrawal routes and isolate and weaken forces. During the exploitation and pursuit, constant pressure can be maintained on the enemy. The specific missions of striking forces depend on the situation. Their missions can be classified into three basic types: operations of limited duration, such as raids; operations to secure deep objectives; and operations to continue the attack. In each operation, alternatives may include pure employment of attack assets, employment of attack assets with an air assault task force (AATF), or employment of aviation assets with ground maneuver forces.

(1) Operations of limited duration. Operations of limited duration may resemble raids or ambushes. As in defensive operations, thorough IPB, timely information, and well–coordinated actions to suppress enemy air defenses are essential. While the destruction of the enemy force is the primary objective, the operation may also play a part in the corps deception plan. Raids and ambushes can rapidly wear down available enemy counterattack forces, making other friendly operations more successful.

(2) Operations to secure deep objectives. Operations to secure deep objectives are deliberate attacks or operations with the goal of occupying terrain in the enemy's rear area.

(3) Operations to continue the attack. These operations exploit successful corps or division offensive campaigns or battles. They prevent the enemy force from reconstituting its defense.

G–3. PLANNING FOR DEEP OPERATIONS

Attack helicopter battalions conducting a deep attack normally will operate at night. As a rule, they require 24 to 48 hours of planning time to execute an attack. They also require accurate and timely intelligence before and during the mission. Aviation deep attack should be characterized by high–payoff targets that are critical to the corps commander's campaign plan. Aviation deep attack operations are the most effective choice against a moving objective (enemy forces). Paragraphs G–4 through G–13 outline the10 steps generally required to execute a deep attack with attack helicopters.

G–4. STEP 1: INTELLIGENCE PREPARATION OF THE BATTLEFIELD

a. Intelligence collection and analysis efforts feed the IPB process. This process integrates the analysis of terrain, weather, and the enemy. Corps and division IPB is continuous and integrated into the deep fight through the deep operations coordination cell (DOCC). The IPB focuses on—

(1) What the enemy force consists of.

(2) Where the enemy is currently located.

(3) Where the enemy is going.

(4) The time lines for the movement.

b. During this IPB, named areas of interest (NAIs) and target areas of interest (TAIs) on the

enemy mobility corridors will be designated. Planners construct the decision support template (DST), using these named areas, templated enemy positions, and anticipated enemy rates of movements. TAIs eventually become EAs for attack helicopter operations and areas in which targets are located for artillery fires and electronic warfare (EW) targets.

c. The IPB determines which specific second–echelon target is selected. The staff constructs an attack criteria matrix that lists and compares specific targets and considers time of attack. The effect on the target, the duration of the effect, and the attack system best suited to destroy or delay the enemy element are analyzed. This analysis passes to the DOCC for further refinement and integration into the scheme of maneuver.

G–5. STEP 2. DEEP OPERATIONS CELL

a. The DOCC conducts targeting meetings twice daily. The corps DOCC focuses on targets to be serviced in the next 72 to 96 hours. The division DOCC focuses on targets to be serviced in the next 24 to 72 hours.

b. Through analysis, these targets become specific high–value or high–priority target sets, organized into the high–payoff target list (HPTL). These targets are deemed by the DOCC to be critical to the plan. From the HPTL analysis, the DOCC can recommend an appropriate system to service the target.

c. Based on the DOCC's recommendation, the commander issues his guidance on the target to attack and the system(s) to use for the attack.

G–6. STEP 3. STAFF PLANNING PROCESS

a. As the commander's issues his guidance, the deliberate staff planning process begins. The G2 staff continues the terrain analysis. Using maps, photos, and the help of the engineer topographic team, the staff analyzes projected ingress and egress routes as well as potential EAs. The staff examines the combined effects of weather and terrain as well as available illumination. The staff also considers the effect that the enemy disposition may have on friendly operations. It considers, particularly, the selected target, enemy air defense (AD) locations, and major uncommitted units (regiment and higher). The staff selects NAIs based on terrain where the enemy commander has to make decisions. TAIs—which likely becomes the EA for the attack—are selected based on terrain.

b. H–hour is established for all systems taking part in the deep attack. The H–hour must allow time for—

(1) Suppression of enemy systems that were identified during the IPB.

(2) Units to be alerted, move to their positions, and conduct the mission.

G–7. STEP 4. DESIGNATING THE ENGAGEMENT AREA

a. The planners develop a sensor matrix that matches sensors to targets. These sensors must be able to collect information against the targets. This matrix will assist later in preparing the collection plan.

b. From the IPB, planners select an EA along the principal avenues of approach. The EA should canalize enemy forces and restrict their movement as well as provide terrain masking and good fields of fire for attack helicopters. The corps IPB to support the aviation portions of

the mission will include terrain analysis to determine the effect of terrain on both enemy and friendly operations. Weather and illumination during the deep attack also are analyzed from both perspectives. Members of the planning staff must be familiar with the capabilities and limitations of enemy and friendly systems. Army aviation factors include night vision devices (NVD) effectiveness, infrared crossover, and Hellfire missile environmental characteristics.

G–8. STEP 5. DEVELOPING THE COLLECTION PLAN

a. Once the EA is designated, G2 planners determine when the enemy will be in the EA. The G3 selects decision points (DPs) along the route to determine when to launch the attack.

b. For example, if aviation units require a 2–hour notice before the enemy enters the EA, DPs must be selected along the avenues of approach at approximately 2 hours' traveling distance from the EA.

c. The G2 develops a collection plan based on available resources to support the selected DPs, NAIs, and TAIs. This plan—

(1) Provides adequate coverage.

(2) Synchronizes sensors (cueing, cross–cueing, and jamming).

(3) Requests national and theater assets.

(4) Begins to provide intelligence support to SEAD.

G–9. STEP 6. MONITORING MOVEMENT OF THE ENEMY

a. Complementary sensors are key to confirming movement of the enemy. For example, a plan may include the use of side–looking airborne radar (SLAR) and long–range surveillance units (LRSUs) to monitor the enemy's movement out of the assembly area (AA) into the NAIs and TAIs. When the number of armored vehicles moving out of the AA reaches the threshold established by the corps, LRSU teams report back to the corps tactical operations center (CTOC).

b. The G2's collection, management, and dissemination (CM&D) section directs the collection effort against the main target. Situation and target development efforts also must be focused on targets that may interfere with the aviation brigade mission; the attack helicopter operation will require SEAD.

(1) At this stage, the intelligence staff is also tasked to collect information on enemy AD targets along planned routes of ingress and egress; the staff also collects information in and beyond the planned EAs. Targets are located on enemy AD installations during this collection effort; these locations are provided to the fire support element (FSE) to update the fire support plan (FSP) that supports the attack.

(2) The FSP includes not only lethal attack on AD targets but also nonlethal (EW) attack. The G3 requests EW support from higher headquarters to engage AD targets in depth. He coordinates with the corps G2 in tasking division EW assets needed to support forward line of own troops (FLOT) penetration by jamming AD C^2 nets near the FLOT. EW support is executed during planned lethal attacks. The mechanisms for accomplishing this tasking are the FSP and the EW annex, both of which are

continuously updated.

G–10. STEP 7. PREPARING FOR CORPS ATTACK

The aviation brigade commander restates the mission to the corps commander 8 to 12 hours after receiving the mission. The aviation brigade warning order ideally is issued at H–72. The aviation brigade tactical CP relocates near the corps main CP shortly after the warning order is issued. The aviation brigade commander and the G2 also submit requirements for intelligence support. If the division is conducting a deep attack, the cycle is compressed. The following steps (8 and 9) assume a corps attack.

G–11. STEP 8. REFINING TEMPLATED ENEMY POSITIONS

a. About H–60, specific orders and requests are sent to corps subordinate divisions, the military intelligence (MI) brigade, adjacent corps, and echelons above corps (EAC). The corps G2 (all–source production section (ASPS) and the CM&D section) develops the requests and passes them to the MI brigade. The technical control and analysis element (TCAE) takes the prioritized collection targets and turns them into collection taskings for the sensor platforms.

b. The TCAE searchs its enemy electronic order of battle data base for the location of radar emitters for enemy AD units that can track the attack helicopters along the ingress route, EA, and egress route. The TCAE also searches its technical data base for frequencies and call signs for the C^2 elements of specific AD units. This data provided tracks communications intelligence (COMINT) and electronic intelligence (ELINT) for units, refining the templated positions of enemy units. This process is refined and updated within 22 to 24 hours.

G–12. STEP 9. HIGH–PAYOFF TARGET LIST

a. From H–60 to about H–24, sensors are identified to cover the corps area of interest on a more or less equal coverage basis. These sources provide an idea of the flow of the battle and possible enemy objectives or intentions. The LRSU is inserted; it positions itself to support the operation as planned. Theater and national assets are requested to provide support as needed and to cover areas beyond the range of corps organic sensor capabilities.

b. During the processing and analysis, special attention is given to targets listed on the HPTL. The collection results reflect friendly capability to detect, identify, and locate targets. The list is developed and refined based on the collection.

c. The HPTL provides the target descriptions, attack times, and attack methods; indicates battle damage assessment (BDA); and contains remarks concerning integration.

d. The aviation brigade target list is forwarded to the corps G2.

G–13. STEP 10. SIX PHASES OF CROSS–FLOT ATTACK

The aviation brigade cross–forward line of own troops (FLOT) attack is conducted in six phases: preparation, penetration, movement to the objective, actions at the objective, return, and restoration. Each phase requires extensive staff planning and coordination from corps level down.

a. Preparation.

(1) Mission analysis. Conduct of mission analysis results in the restated mission and warning order (WO).

(2) Intelligence preparation of the battlefield.

(a) The CM&D section must ensure that appropriate imagery intelligence (IMINT) and signals intelligence (SIGINT) sensors are available throughout the attack to continuously update attacking aircraft and to provide BDA.

(b) Aviation elements are updated through intelligence reports from the CTOC to the aviation brigade tactical command post (CP), located near the corps main CP.

(c) The aviation brigade uses the corps' IPB as a starting point. The deep attack AO is the main focus for the aviation brigade S2. From the corps IPB, the aviation brigade S2 narrows the focus to address the axis of attack, ingress routes, the objective area, and egress routes. In selecting multiple routes and positions, the S2 considers primary and alternate routes, positions, and EAs. Air routes should bypass enemy units, especially AD. Terrain should afford terrain masking—for example, swampy, hilly terrain; mountains; and dense forests.

(d) For sensor planning, all sensors involved from H–hour through the return phase must be in place and functioning as planned.

(e) The movement of the enemy through the NAIs is observed at the decision point. This event triggers the aviation cross–FLOT deep attack. This sequence is depicted graphically in a DST.

(3) Task organization. Based on the mission analysis and situation, the attack helicopter commander may task–organize his force. The attack helicopter company (ATKHC) may organize its eight AH–64s Apaches into light and heavy teams. The light team (two AH–64s) may be equipped with eight Hellfire missiles, a mix of 38 Hydra–70 rockets, and 1,200 30 millimeter (mm) cannon rounds. The team designates targets for the heavy attack team and provides all–round security. The heavy attack team (four AH–64s) will equip their aircraft with a maximum load of 16 Hellfire and 1,200 30mm cannon rounds. The heavy team remotely engages targets designated by the light team.

(4) Gun–to–gun lay comparison (missile math). Building this matrix allows the staff to compare the relative combat power of an attack helicopter battalion (ATKHB) against the opposing enemy unit. For example, a former–Soviet Union (FSU) tank regiment has about 150 combat vehicles. With an operational readiness rate of 90 percent, the tank regiment would roll forward with 135 operational combat vehicles. The ATKHB will attack the tank regiment with 192 Hellfire missiles. A probability of hit of 60 percent has been determined from previous firing data. This allows a factor for defective missiles, combat losses, and combat environmental effects. The aviation brigade commander had established a 70–percent destruction goal in his end state. This process of estimation shows that a possible 115 combat vehicles would be destroyed.

(5) Command, control, and communication. Key staff officers at the division or corps main CP normally plan and execute deep operations. Key personnel—the G3, assistant G2, fire support officer (FSO), air liaison officer (ALO), and aviation brigade commander—must take part in planning and executing the operation.

(a) The aviation brigade positions a ground tactical CP; the tactical CP expedites C^3 near the forward assembly areas (FAAs) of the ATKHBs. During the mission,

the attack helicopter brigade commander may command and control from an airborne tactical CP (UH–60 Black Hawk).

(b) The battalion commander's location is key to his decision–making process; it also is crucial to his ability to control battalion actions as the operation unfolds. The FAA is the last face–to–face coordination point between companies of the battalion. The battalion commander can command and control from aircraft or the ground. However, when he is in an aircraft he is with the fighting force and can make accurate and timely decisions. Any cross–FLOT operation will be battle–drill and standing operating procedure (SOP) oriented. Radio listening silence can be maintained during the mission.

(c) Communication between forward–deployed aircraft and CPs is the greatest challenge to ATKHB deep operations. The fluid nature of the battlefield and high–risk nature of this operation require the attack aircraft battalion commander to be able to constantly communicate with the tactical air coordinator (TAC) to receive and relay critical combat information.

(d) Synchronization and avoidance of fratricide must produce the maximum combat power at the decisive point to defeat the enemy. Army aviation focuses on the routes, FAAs, holding areas, air control points, and battle positions (BPs) to synchronize Army airspace command and control (A^2C^2). Synchronization enhances the combat power of the total force by preventing duplicate efforts.

(e) The corps A^2C^2 element coordinates, integrates, and regulates the corps airspace. For the cross–FLOT operation, the aviation brigade commander must coordinate employment of his assets according to the A^2C^2 plan. To prevent engagement by friendly AD forces, the commander must exploit the existing C^3 structure. He also must require his forces to adhere to directed control measures.

(f) The EA may be designated a restricted operations zone (ROZ), which is controlled by corps. The aviation brigade likely will receive a special corridor from the corps rear area to the BPs near the EA. This special corridor is large enough for the aviation brigade's air corridors. Restricted operating zones have been set up for unmanned aerial vehicles (UAVs) and Guardrail to support aviation deep operations. The battlefield coordination element (BCE) has planned an air interdiction (AI) ROZ. This zone is scheduled to be implemented after the aviation deep operation. SEAD targets are designated as airspace coordination areas to keep the aircraft from overflying probable impact areas. An airspace coordination area is established around each downed aircrew pickup point. This area protects aircrews and rescue personnel from friendly fires. The AD weapons control status in the special corridor is "weapons hold." Specific control measures will ensure that air and ground maneuver forces are synchronized.

(6) Execution matrix. An execution matrix is established to synchronize execution. It includes intelligence; aviation maneuver; fires; USAF; and C^3. The matrix includes the time line in relation to the DST and cross–FLOT penetration (F–hour). It also includes such key events as identifying the enemy at the NAIs and implementing the event sequence.

(7) Assessment of new and additional priority intelligence requirements (PIRs) against current PIRs. The G2 section—ASPS and CM&D—continue the IPB. The situation is further developed. At the same time, the isolation of high–payoff targets is assessed; also collection tasks are finalized for corps and division assets.

(a) Target development continues in support of the deep attack. At about H–48, the aviation brigade tactical CP moves forward and establishes communications. The final aviation brigade order also is issued; detailed fragmentary orders (FRAGOs) follow; updates are provided.

(b) The collection plan is revised at about H–24. This revision is based on the chosen course of action and HPTL. The drive to target acquisition begins. Specific targets are focused on, and target locations are refined, that are within the tolerance of weapon systems to be used against each specific target. A matrix is developed to support coordination and execution of SEAD. The matrix also supports the deep attack of the enemy force. The corps G2 (CM&D section) reviews the matrix.

(c) The collection plan must support both target development and acquisition and situation development. Agencies must be tasked and sensors requested to support this plan. Sensors and processors are focused electronically or physically; these begin to isolate targets in time and space. The analysis effort concentrates on targets on the HPTL.

(8) Logistics. The aviation brigade requires substantial logistical base augmentation—especially in fuel and munitions—to sustain combat operations. All aviation maintenance and support functions must be tailored to support aviation deployments and operations.

(a) While in the corps rear area, the general support (GS) maintenance battalion, aviation maintenance battalion, and contact teams provide continuous support on an area basis. During the deep attack preparation phase, a portion of each support element moves forward with the aviation elements. Corps planners must coordinate the space for support elements in the division rear area.

(b) As H–hour approaches, CS and CSS elements move to their designated locations. Intelligence units position to support the deep attack. Sensors identified are on–station as the sequence begins. The aviation brigade and the FSE receive final updates to revise the SEAD plan.

(9) Attack positions. The preparation phase closes at H–hour; the ATKHBs are in their attack positions. The aircraft turns off their identification, friend or foe (IFF) transponders as they cross IFF OFF line. (This line is established by the A^2C^2 element after coordination with the air support operations center (ASOC) and other activities.) The aviation brigade tactical CP locates near the ground brigade main CP. This proximity enhances terrain management and ultimately the forward and rearward aerial passage of lines. AD weapons status and artillery fires (SEAD) receive final coordination and verification.

(10) Event sequence.

(a) The decision to attack is made. It is based on the enemy's projected rate of movement and the time anticipated for a synchronized response from the corps. The corps staff's final coordination and verification are based on actual time; this time then becomes the basis for the attack helicopter units crossing the line of departure or the artillery units shooting their first SEAD missions.

(b) Based on the collection plan, sensors are expected to detect the enemy in the NAIs. Decisions are made to attack according to the event sequence based on actions at the decision points. The cross–FLOT penetration time, or F–hour, also is established at this time. Mobile subscriber equipment (MSE) and frequency modulated (FM) radio are among the means of disseminating orders to execute the sequenced events. The corps commander has established checks to monitor and control units executing their sequenced tasks.

b. Penetration.

(1) An aviation cross–FLOT operation is a combined arms maneuver mission; it requires the support of all arms. All corps units involved with the battle must take part in planning and coordination to preclude fratricide. The corps must coordinate the passage points with the division to expedite the passage of lines. This operation requires a plan for a series of fires integrated into a strict time sequence. This sequence may include multiple crossing points, a ground feint, and an aerial ruse at the crossing site to divert enemy radar and attention.

(2) The fire FSP for this operation is planned in detail to assist in crossing the FLOT. The fires should be scheduled so that they begin before forces cross the FLOT and end before the lead aircraft arrives at the FLOT. (Particular attention should be paid to the effects of the fires on friendly aircraft.) Communications jamming (COMJAM) should end as aviation units leave friendly artillery range. ELINT jamming continues until the aviation unit returns.

(3) Aviation planning requires tactical maps that reflect mission graphics to include: times, routes, hazards, headings, distance, airspeed, altitudes, navigation way points, and known or templated enemy locations.

(a) Route separation considerations should include the separation of company flight paths by as much as 3 to 5 kilometers (kms). This separation improves survivability; a single threat system is thus less likely to acquire and destroy the entire attack force. A holding area short of the FLOT is planned in case the operation is delayed after attack companies depart the AA. A^2C^2 may require that all cross–FLOT routes be combined into one corridor.

(b) Key strengths of the AH–64 ATKHB are the speed, mobility, and capability to operate in darkness and in low visibility. All of these enhance the battalion's survivability. They also improve its prospects of maintaining stealth and surprise. Route planning—both forward and behind the FLOT—is based on terrain that limits the enemy's direct fire potential and conceals aircraft from electronic, radar, and visual acquisition. In conjunction with dead reckoning, Doppler is the key navigational aid in the AH–64. However, it must be updated periodically using known terrain points.

(4) At F–15 minutes, as the SEAD operation begins, the attack companies move forward from the FAA to identify the passage points. Aviation brigade liaison officers (LOs) coordinate the forward and rearward passage of lines. They ensure that the passage point location is correct. They also ensure that the local AD fire control status has been adjusted for the passage of friendly aircraft. The LO may even give a visual signal to the AH–64s as they pass through the FLOT; this signal provides a known point on the ground for a Doppler update.

(5) As the aviation unit prepares to cross the FLOT, the aviation brigade tactical CP receives intelligence updates. The FSE updates the SEAD plan from constant updates on the enemy AD picture. At this time, some intelligence collection shifts to the engagement area.

(6) Once past the FLOT, the attack force must execute a precise plan. Each member of the attack force must be briefed on contingencies that may arise as the tactical situation changes. Speed is essential as the AH–64s penetrate the FLOT and proceed forward to the EAs. Avoidance or rapid suppression of enemy fires and continued movement to the objective area are key to mission timing and synchronized arrival into BPs as the enemy enters the EA. The degree of separation between aircraft normally is a decision based on visibility and terrain.

(7) The speed and altitude used by attack helicopters are related to the threat, weather, and terrain. The lead company may be required to immediately suppress enemy systems that threaten the force while en route to the objective. Once out of tactical fire (TACFIRE) digital communication range, the FSO (UH–60) passes fire missions by voice FM or ultra high frequency (UHF) to the CTOC. At the CTOC, the field artillery intelligence officer (FAIO) ensures that no conflict occurs between maneuver unit movement and artillery fires passed to firing artillery units.

c. Movement to the Objective. During the movement to the objective, intelligence updates the AD picture as the aviation attack continues. AD concentrations or significant changes, as well as situation reports, are reported to the attacking units over radio relay.

(1) The light attack team reconnoiters the route holding areas and BPs. Then it will maneuver to forward BPs so that it can visually acquire and identify targets.

(2) The attack helicopters will engage targets from concealed BPs that are designated in the operation order.

(a) BPs are selected in relation to the EA from a careful map study and kill zone analysis. Mutual support, overlapping coverage, and the laser–to–target line are primary considerations. In addition, staffs must consider the sensor effectiveness and the probability of kill of the helicopter's weapons systems.

(b) In deep operations, the occupation of BPs may be difficult if they have not been reconnoitered and secured. How the AH–64 disperses within a BP is terrain–dependent. BPs have to be adjusted significantly to obtain optimum fires on targets. The BP must be secured while it is occupied. Crews are assigned sectors of responsibility for periodic air and ground sweeps.

(c) If the tactical situation allows, a portion of the force may be totally dedicated to

the security mission in the objective area.

d. Actions at the Objective.

(1) Intelligence collection at the objective. As the aviation unit arrives at the objective, all sensors report current activity in the objective area.

(2) Target engagements. The engagement is best begun by using heavy team AH–64 remote fires. These fires optimize surprise, confuse the enemy, and allow the commander to better assess the target array. The light team designators may then fire autonomously; they use complementary engagement techniques to suppress enemy air defense artillery (ADA). If surprise is achieved and a target–rich environment is observed, the company commander should consider moving the heavy team forward; then he can direct all aircraft to engage autonomously to further reduce total engagement time.

(3) Fire distribution and control. Well–established target engagement techniques and procedures in which personnel have been thoroughly trained result in optimum kills in the EA with less exposure to enemy fires. When surprise is achieved, as many targets as possible should be rapidly developed in the assigned order of priority. To prevent multiple shots on the same target, each battalion task force (TF) must adhere to the fire distribution plan. The EAs should be broken down into smaller kill zones for pre–positioning the target acquisition and designation system (TADS); battalion or company boundaries should follow or cross an easily identifiable terrain features. Each company will be assigned a company kill zone; this zone will, in turn, be divided into smaller areas for each attack helicopter.

e. Return. While the attack unit engages the target, intelligence collection begins to shift to the egress route. Locations of enemy AD radars that have been illuminated during the attack will be passed to the FSE to update the SEAD plan. Any new concentrations of enemy AD will be reported to attacking units.

(1) Withdrawal from the objective. As the heavy team reports "ordnance expended," the light team provides massed rocket fires to allow the attack force to break contact with the enemy. The light force is loaded mainly with a mix of high–explosive and multipurpose submunitions and Hydra–70 rockets.

(2) Return route and rearward passage of lines. Return to and reentry through the FLOT differ mainly in the selection and use of different egress routes and the use of onboard aircraft survivability equipment (ASE). The corps must now coordinate the passage of lines by changing the AD weapons status of the ground maneuver units. ASE and IFF systems will be employed to the maximum to defeat all possible threat AD systems during the penetration of the FLOT. Immediately after recrossing the FLOT, companies assemble at designated holding areas for sequencing into the forward arming and refueling point (FARP).

(3) Battlefield damage assessment. Based on the collection plan, the BDA starts as soon as the return phase begins. Sensors obtain intelligence for the corps to estimate the enemy's combat effectiveness. They also provide probable courses of action and a window of opportunity for friendly maneuver deep fires.

f. Reconstitution and battle damage assessment. After FARP operations end and the battalion has moved out of artillery range, the attack battalion debriefing occurs. It involves not only the commander and members of the aviation brigade and group staff but also personnel from division and corps.

(1) The attack helicopters perform postflight checks. These checks determine whether aircraft need repair before they are sent from the FAA to the corps rear area. The entire battalion staff will be involved in the recovery. The battalion quickly moves back to the AA in the corps rear area where CSS can be focused on the battalion. The ATKHB will require 24 to 48 hours to prepare for another deep operation.

(2) All available sensors turn to BDA. They determine the results of the attack and the enemy commander's reaction. The combat effectiveness of the enemy must be ascertained. Thus, the corps planning staff will know the options the enemy army commander now has. The completion of the attack starts the planning cycle again; the attack and its effect on the corps commander's campaign plan must be evaluated.

Table G–1. Deep Planning Checklist

X	STEP	ACTION	WHO
	1.a	Conducts a risk analysis to decide if the mission payoff exceeds the risk.	DOCC
	b	Focuses intelligence assets to gather essential mission data.	G2/DOCC
	c	Evaluates all deep operation assets to determine which should participate; for example, multiple launch rocket system (MLRS), US Air Force tactical air (TACAIR), aviation brigades, and ground forces.	DOCC
	d	Prepares operation orders (OPORDs), including basic task organization, so that sufficient combat power and assets are available.	G3/DOCC
	e	Prepares combat service support (CSS) plans to obtain resources for the operation.	G4/DOCC
	f	Provides airspace management and control procedures.	G3
	g	Focuses assigned intelligence assets to gather essential mission data, tasks intelligence assets from other Army or joint sources as needed and identified during intelligence preparation of the battlefield (IPB), and identifies enemy air defense (AD) locations and dispositions.	AVN BDE
	h	Links the intelligence effort to the higher headquarters.	S2
	i	Conducts a mission analysis after receiving the OPORD from the higher headquarters.	STAFF
	j	Conducts a risk analysis.	CDR/S3
	k	Determines the task organization and requests additional or special combat forces (for example, special electronic mission aircraft (SEMA) assets for communications enhancement while in the deep area of operations).	S3

	l	Prepares OPORDs, including task organization.	S3
	m	Prepares CSS plans.	S4
	n	Plans for medical and maintenance evacuations.	S4/AMO
	o	Prepares aircraft and forces for operations.	S3
	p	Prepares a fire support plan to include suppression of enemy air defenses (SEAD) (for example, MLRS, TACAIR)).	FSO/S3
	q	Prepares search and rescue and downed aircrew recovery plans.	S3
	r	Positions CSS (minimal amounts) as appropriate.	S4
	s	Provides liaison officers to units affected by brigade ingress and egress routes and to higher and adjacent units as needed.	3
	t	Prepares a SEAD plan and requests or coordinates for other joint assets to support the plan to include movement to and from the objective area.	FSO/S3/S2
	u	Determines friendly dispositions and coordinates air routes to and passage points through the forward edge of the battle area (FEBA) or forward line of own troops (FLOT).	S3
	2.a	Focuses all intelligence and electronic warfare (IEW) support and executes the SEAD plan (for example MLRS, tube artillery, TACAIR).	ATKHB
	b	Observes Army airspace command and control (A^2C^2) control measures.	ATKHB
	c	Uses minimum–risk routes based on AD locations and enemy dispositions.	ATKHB
	3.a	Executes contingency operations as required.	ATKHB
	b	Uses tactical air, as available, to include joint air attack team (JAAT).	ATKHB
	c	Seeks preplanned secondary targets if primary targets are unavailable.	ATKHB
	d	Executes mission–abort if the objective is compromised based on criteria previously established.	ATKHB
	4.a	Employs preplanned minimum–risk return routes other than those used en route—A^2C^2.	ATKHB
	b	Executes the SEAD plan during the return from the objective area, if applicable.	ATKHB
	c	Reenters at appropriate passage points that were previously coordinated with frontline friendly forces. (Liaison elements are critical to this phase.)	ATKHB
	d	Proceeds to assembly areas.	ATKHB
	e	Debriefs all crews, forwards intelligence reports to higher headquarters.	ATKHB

Appendix H

Environmental Concerns and Compliance

This appendix is a guide by which to attain a balance between accomplishing the mission and protecting environmentally sensitive areas.

H–1. ENVIRONMENTAL AWARENESS

Unit preparations to conduct aviation operations, in any environment, can incorporate the necessary environmental awareness with minimal additional planning. Many aspects of environmental protection discussed below are common sense and most likely will be a part of a unit's operational activity.

H–2. PREPARATION FOR TRAINING

Advanced preparation is key to successful completion of training and the same holds true for environmental awareness and protection. The commander should be aware of the publications governing environmental protection. All unit staffs (company and above) should designate an environmental compliance officer/noncommissioned officer (NCO) to serve as unit point of contact (POC). This person will be responsible for environmental education, standing operating procedures (SOP) updates, incident reporting, etc. Army Regulation (AR) 200–1 and AR 200–2 explain the Army's environmental programs. Appendix A, in both regulations, references the additional documents that should be reviewed. Training Circular (TC) 5–400 provides a comprehensive listing of all items of interest to prepare for operating near and avoiding environmentally sensitive areas.

   a. The following general matrix on POCs should assist in planning for environmental factors affecting unit training:

Topic	Point of Contact
Air pollution	Environmental Division (ED)
Archeological and historic sites	ED and Natural Resources Branch (NRB)
Clean and safe water	ED
Hazardous materials and waste	Directorate of Logistics (DOL), Defense Reutilization and Marketing Office, ED, fire department
Noise pollution	ED, Range Control (Directorate of Plans, Training, and Mobilization (DPTM))
Range clearances and restrictions	Range Control (DPTM)
Standing operating procedures	ED
Spill reporting	ED
Threatened/endangered species	NRB
Water pollution	ED

Wetland protection	NRB, Range Control
Wildlife management	NRB, Range Control

b. Most topics can be reviewed by contacting the ED, NRB, and/or Range Control. In most cases, the ED and the Natural Resources Section are located under the Directorate of Public Works (DPW). In cases in which training is conducted overseas, refer to the host nation equivalent of the POCs listed above. If there is no host nation equivalent, all training will be conducted under US policies and requirements. Units should coordinate with these organizations to provide a briefing before the start of mission training.

H–3. ARMY ENVIRONMENTAL COMPLIANCE ACHIEVEMENT PROGRAM (ECAP)

Units that handle hazardous waste (HW) and hazardous materials (HM) must designate, in writing, a hazardous waste coordinator. The unit must comply with ECAP protocol and will be periodically inspected. ECAP protocols should be obtained from the ENRD/DPW or, if they are unable, then call the Army Environmental Hotline at 1–800–USA–3845 or DSN 584–1699.

H–4. UNIT LEVEL ENVIRONMENTAL PROGRAMS (REFER TO TC 5-400)

Step	Action
1	Ensure all unit personnel have had, or are scheduled to receive, environmental awareness training.
2	Designate, in writing, an environmental compliance officer and an HW coordinator, and ensure these persons are properly trained and qualified.
3	The unit environmental compliance officer will interface with appropriate environmental personnel and ensure that the unit complies with environmental laws and regulations.
4	Meet with battalion S3, S4, and installation personnel who deal with environmental issues.
5	Identify requirements concerning ECAP inspections that may affect a unit, identify problem areas and how to avoid them.
6	Ensure SOP addresses environmental issues/procedures that apply to the unit and coordinate environmental requirements with appropriate installation/chain of command personnel.

NOTE: Personnel to contact to support unit is the chain of command, DPW, Staff Judge Advocate (SEA), and Range Control.

H–5. TYPES OF UNIT PROGRAMS (REFER TO TC 5–400)

a. HM programs.

b. HW programs.

c. Hazardous communications (HAZCOM) programs.

d. Pollution prevention and hazardous waste minimization (HAZMIN) recycling programs.

e. Spill prevention and response plan programs.

NOTE: TC 5–400 gives specific guidance on environmental protection matters and should be followed. This appendix is intended to supplement, not replace, TC 5–400.

H–6. CONDUCT OF THE MISSION

Environmental concerns pertaining a mission could be incorporated into the mission briefing using the mission, enemy, terrain, troops, and time available (METT–T) acronym. Some of the factors affecting the briefing should be unit mission, geographical location, and time of the year.

a. Mission.

(1) Identify and assess known environmental risks during planning.

(2) Determine environmental impact on mission execution.

(3) Specify those areas to avoid and minimize the effect on units' schemes of maneuver.

(4) Select alternate training methods or goals.

(5) Provide maps/sketches with detailed areas of environmental concern.

(6) Emphasize the importance that every soldier play an active role in the identification, and timely reporting, of new environmental risk elements.

(7) Rapidly and effectively respond to all petroleum, oils, and lubricants (POL) and/or hazardous waste accidents.

(8) Aircraft transporting hazardous material/waste should select routes that allow for quick access in case the aircraft should have to land unexpectedly.

b. Enemy.

(1) Identify areas of probable environmental contamination that could affect friendly force movement.

(2) Evaluate intelligence reports of enemy equipment/capability and how it would be employed against the environment.

(3) Develop enemy target options to minimize environmental effects.

(4) Maneuver enemy action away from environmentally sensitive areas, when feasible.

c. Terrain and weather.

(1) Provide recommended paths of movement to avoid environmentally sensitive areas.

(2) Emphasize navigation accuracy and identify well–defined terrain features to assist.

(3) Obtain and analyze predominant and developing weather patterns to diminish possible environmental risks.

d. Troops and equipment.

(1) Develop a briefing for all soldiers that highlights and defines the environmental concerns/points of interest.

(2) Provide a detailed and accurate SOP that identifies guidelines to avoid risk areas and not inhibit mission accomplishment.

(3) Anticipate areas of probable risk and brief troops on how to prevent damage.

(4) Employ practice scenarios that test soldier response to changing environmental risks and promote the decisionmaking process.

(5) Require accurate and timely reports that pertain to any environmentally concerned issues, friendly or enemy.

e. Time.

(1) Maximize planning time and minimize complexity of mission brief.

(2) Practice and develop various mission profiles that emphasize adjusting for changing environmental factors, while maintaining the desired momentum.

Appendix I

Shipboard Operations

I–1. GENERAL

a. In nearly every major conflict and operation since World War II, Army aviation has been assigned missions in the maritime environment. In these missions, aviation forces either were based off naval vessels for land attack or they operated from ships for sustained overwater missions. In recent years, the nature and complexity of those missions have changed dramatically. They now dictate that aviation units complete specialized preparatory and sustainment training. Recent worldwide deployments have shown that Army aviation has a versatile combination of equipment sophistication, deployability, and personnel. With these assets, aviation forces accomplish specific strategic missions that require operations in the maritime environment.

b. Army aviation units presently are taking part in many joint operations that require proficiency in shipboard operations to accomplish these and other missions:

(1) Casualty evacuation (CASEVAC) from shore to ship.

(2) Logistics transfer and resupply.

(3) Reconnaissance and sea lane surveillance.

(4) Maritime security operations, small boat interdiction, ship takedown, and area denial.

c. FM 1–111 supports planners to prepare for air–sea missions. Specifically, it supports those missions that require landing on, and operating from, US Navy (USN) and Coast Guard air–capable ships. FM 100-5 stresses the need for training and preparing for shipboard operations. Chapter 4, *Joint Operations*, states, "A force projection army requires extraordinary flexibility in thinking about operations because of the variety of combinations of joint forces available and the range of possible circumstances for their employment. Army doctrine stresses unified air, land, sea, and special operations—all supported by space operations—throughout the theater of war."

d. The current document governing Army shipboard operations is the "Army/Air Force Deck Landing Operations Memorandum of Understanding" (MOU). The Army (USA), Air Force (USAF), and USN signed the manual in July 1988. Information from this MOU is supplemented, as necessary, to provide more comprehensive guidance in planning and conducting Army aviation shipboard flight operations.

e. FM 1-564 provides shipboard operations tactics, techniques, and procedures (TTPs) for Army aviation units. Published by the US Army Aviation Center, Fort Rucker, AL, it is available through the publication system of the US Army Publishing Agency (USAPA), ALEX VA. The manual contains more detailed information for staff and aircrew planning and training. The following paragraphs summarize planning considerations for shipboard operations.

I-2. SHIPBOARD TRAINING

a. Nearly all regional contingency plans, joint task force (JTF) plans, and counternarcotics operations contain shipboard or overwater specified tasks. Therefore, units must precisely define their missions. Shipboard missions require deck landings and support while operating from a ship. Overwater missions include operations over open water, but originate/end at a land base.

b. Scarce resources dictate that shipboard operations be a priority mission essential task for a unit to conduct this training. A higher command or the emergent nature of the training requirement designate the priority.

c. The Joint Force MOU identifies service responsibilities in support of shipboard operations.

(1) *Navy.* The Fleet Commander's staff schedules Army requests for deck landing qualification (DLQ) services on ships trained, staffed, and certified to conduct shipboard training and/or overwater gunnery. The Navy can make specific personnel available for ground school or flight operations training. The Army is responsible for helicopter operating costs, as well as temporary duty (TDY) expenses.

(2) *Army aviation.* Commanders of units scheduled to conduct DLQ training ensure that training and logistics prerequisites for shipboard helicopter operations are satisfied.

(3) *Overwater gunnery training.* Army aviation units wanting to conduct overwater gunnery while basing from a ship must identify all ordnance intended for stowage onboard during the presail conference. All ordnance must be certified shipboard safe according to NAVSEA OP-4 before onload.

(4) *Night vision devices training.* The Chief of Naval Operations, Code N889, authorizes shipboard night vision devices (NVD) operations. Units must request authority to train with NVD through their chain of command to the Headquarters, Department of the Army, Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS) (DAMO–TRO), WASH DC, on an annual basis.

(5) *Nonstandard aviation maneuver training.* Any request to conduct nonstandard aviation maneuvers in the shipboard environment must be briefed thoroughly at the presail conference. This should enable the ship commander to obtain the necessary guidance and regulatory information to approve or modify training plans.

I–3. PRESAIL CONFERENCE

a. The presail conference is the coordination meeting between the host ship and the operations unit for safety and operational planning. It takes place onboard the host ship.

b. Once a ship has been assigned to fill a specific Army request, the Navy approves

direct coordination so the aviation unit can coordinate with the ship for an acceptable presail conference date. The Army Force Representative also can help in setting a date for the conference, which generally occurs as close as possible to the actual service date.

c. Every deployed amphibious group has an Army officer assigned as a liaison officer (LO). This officer normally is an Aviation Branch Major. The LO may be helpful in coordinating logistical and training requirements with the Navy.

I–4. LOGISTICS

a. *Logistics Requirements.* The logistics requirements to support a shipboard training service depend on the duration of the service and whether the unit embarks or maintains a shore base.

b. *Publications.* Army units can use the USAPA publications system to order joint publications. For information on Navy publications, use the following phone numbers to contact the Navy Publications Customer Service Center, Philadelphia, PA: DSN: 442–2997/2626/0160/2267.

c. *Funding.* The ship conducts deck services together with a normal training schedule; therefore, the Army does not incur use or fuel charges.

d. *Fuel.* Naval aircraft use JP–5 fuel only; therefore, Army units must ensure that they use JP–5 before embarkation so the fuel system does not contain residual JP–4. Units possessing unique refuel devices—such as Wiggins nozzles—must bring them onboard during their deck service period to ensure proper refueling procedures.

e. *Embarked Unit Assignments.* When an Army unit embarks on the Navy ship, it can expect to be assigned duties on the ship to augment the ship's company. These assignments may include security watch, cleaning details, fire watch, and mess support. Assignments will be made through the Army chain of command on the ship.

f. *Aircraft Maintenance.*

(1) Support facilities vary from ship to ship. Consult the Aviation Facilities Resume for specific ship capabilities. Units must plan to support their unique aircraft maintenance requirements by preparing logistics replacement units and packup kits for deployment to the shore base or the ship.

(2) Army aircraft are not manufactured to the anticorrosion standards of Navy aircraft; therefore, they are prone to corrosion. Units should plan to purchase an anticorrosion compound for their aircraft before embarkation.

(3) The ability to conduct fresh water washes onboard does exist; however, large numbers of aircraft on the deck, as well as ground support equipment (GSE), may prevent washes from being feasible.

g. *Ground Support Equipment (GSE).* Embarking units must identify all equipment being brought onboard for safety and compatibility checks. This equipment includes ground handling wheels, tow bars, and blade folding kits.

h. *Aviation Life Support Equipment.*

(1) Additional aviation life support equipment (ALSE) that is needed before embarkation includes helicopter emergency egress device system (HEEDS) bottles for all aircrew members.

(2) Aircrew members must have a life preserver unit (LPU) for overwater operations.

(3) Aviation units will coordinate with the Navy to secure all required ALSE before embarkation.

I–5. WITH HOW MANY AIRCRAFT CAN THE UNIT DEPLOY?

a. During the presail conference, the number of Army aircraft that are physically able to be brought onboard the ship will be decided. It is implied that, when an Army unit is given the mission to embark on a Navy ship, the assigned ship will be able to carry the unit's aircraft or the number required by the directive.

b. The Navy ultimately will dictate the number of aircraft that can be deployed on the assigned ship. Considerations for this decision can include the following—

(1) A large aircraft carrier like the USS *Eisenhower* (CVN 69) conceivably could carry hundreds of Army helicopters; however, the ship's units have to continue to operate, including vertical replenishment (VERTREP). This requirement precludes stacking helicopters on every inch of the flight deck. This lack of space becomes more important on smaller, single– or dual–spot ships. The Navy considers its own missions, as well as flight deck mobility and fire fighting/rescue capabilities, when planning for Army aircraft. **NOTE:** A flight deck overcrowded with Army helicopters may slow or prevent a timely rescue if there is an emergency on the ship during flight operations.

(2) During a deployment, it is not uncommon for the Navy to park aircraft with their tailbooms positioned off of the flight deck, hanging over the water. Because AH–64 Apache aircraft are "tail draggers," meaning that they have landing gear installed on their tails, these aircraft cannot be parked this way. A unit equipped with AH–64 aircraft may not be able to carry as many aircraft onboard a ship as a OH–58D(I) Kiowa Warrior or AH–1 Cobra unit because of parking space.

c. The ship for the mission is identified. Then the number of Army aircraft to be deployed is decided. Army planners may gain specific information on the ship from the Navy manual NAEC–ENG–7576. This manual contains diagrams of all Navy ships and their landing facilities. If there are additional questions, units may contact the Shipboard Aviation Facility Hot Line. This facility can confirm—

(1) Criteria or standards specified in air capable ship aviation facilities bulletins.

(2) Criteria or standards specified in amphibious assault ship aviation facilities bulletins.

(3) Criteria or standards specified in visual landing aids general service bulletins.

(4) Ship certification status.

(5) Shipboard equipment, configuration, and deficiencies.

(6) Any other matter relative to aviation facilities aboard air capable and amphibious aviation ships.

The Hot Line phone number is DSN: 624–2592; Commercial (908) 323–2592.

I–6. AIRCREW REQUIREMENTS FOR TRAINING

a. *Army Aviators.* Army aviators must be qualified and current according to AR 95–1.

b. *Pilot in Command.* The pilot in command (PC) will be DLQ and current.

c. *Pilot Performing Deck Landing.* The pilot performing the deck landing will be DLQ and current unless undergoing training.

d. *Initial Qualification.* Flight training must be conducted by an Army instructor pilot (IP) or unit trainer (UT) who is deck landing current in the aircraft and in the flight mode, or an approved Navy helicopter aircraft commander (HAC). Units just starting their DLQ program require a current IP from another unit to qualify the new IPs for the new unit to begin training.

(1) *Ground school training.* The ground school course will include but not be limited to—

(a) Aircraft landing and handling signals.

(b) Deck markings and lighting orientation.

(c) Emergency procedures.

(d) Communications, navigation aids (NAVAIDs), and emission control (EMCON).

(e) Fuel/Maintenance support and procedures.

(f) Landing patterns/Approaches and ship control zones.

(g) Vertical replenishment (VERTREP) procedures (if applicable).

(h) Presail conference procedures.

(2) *Initial qualification and currency.* Single/dual (herein after called single) spot ship initial day qualification consists of—

(a) Flight training conducted by either a USA/USAF DLQ standardization instructor pilot (SP) or a USN HAC who is current on single–spot decks.

(b) Six field deck landings before six single–spot shipboard landings, all within

a 10–consecutive–day period.

(c) As far as currency requirements, four single–spot shipboard landings within 90 days. Pilots whose currency has lapsed and have not made four single–spot landings within the last 181 days must undergo initial qualification training.

(d) Night single–spot helicopter operations require significantly more training and specialized equipment than day operations and may not be conducted except for life–threatening emergencies or operational necessity. Requests for this type of training will not normally be approved. Exceptions will be handled on a case–by–case basis by the USN (OP–593) and the USA (DAMO–TRS).

(3) *Multispot ships inital day qualification.*

(a) Multispot ships include—
- Landing platform helicopter (LPH) [amphibious assault ship].
- Landing helicopter assault (LHA) [amphibious assault ship, general purpose].
- Cruise vehicle (CV) [attack aircraft carrier].

(b) Multispot ships initial day qualification consists of—
- Flight training conducted by a USA/USAF IP or UT who is day current.
- Five day field deck landings before 5 day shipboard landings, all within a 10–consecutive–day period.
- Day currency requirements, four shipboard landings within the preceding 9 months. (Pilots whose day currency has lapsed will undergo initial day qualification; requalification will be conducted by an Army IP, UT, or PC.).
- Initial night qualification include six night field deck landings before six night shipboard landings, all within a 10–consecutive–day period. (Pilots also must comply with the 72–hour requirement in (4) below.)

(4) *Night currency requirements:* Six night shipboard landings within the preceding 90 days are required to maintain currency. If more than 72 hours have elapsed since the last night shipboard landing, one day shipboard landing will be performed within 24 hours before the next night shipboard landing.

e. *Single–Spot Deck Landing Qualification Training.* This training is the most demanding because of the size of the deck space and the size of the ship. Pilots qualified on single–spot ships are qualified on multispot ships, but the reverse is not true.

f. *Aircraft Carriers.* Routine DLQ training and operations normally will not be conducted on CV class ships. Operations on CV class ships will be on a case–by–case basis ; they require a special ground brief by Navy personnel, or Army/Air Force personnel designated by the Navy to give the briefing. Pilots qualified and current on single and multispot ships are considered qualified and current on CV class ships.

g. *Techniques for Aircrew Currency.* Once a unit is identified as requiring continual shipboard currency for its aircrews, the command should consider the following:

(1) Identify unit IPs and UTs that must stay current in shipboard operations. Units will make currency a priority mission for these officers.

(2) Units must continually assess the longevity of these shipboard operations trainers, and identify officers with enough time on station to adequately take over the responsibility when required.

(3) Establish a liaison with a Navy, Coast Guard, or Marine unit that can help keep the unit shipboard operations trainers current. For example, a Marine aviation squadron may be able to include an Army aircraft and crew during their shipboard currency training.

h. *Other Training Requirements.* While sometimes waivered by the Fleet Commander, the following are requirements by Navy regulations:

(1) *Firefighting school.* If the Army unit is embarked as part of the ship's company, all soldiers must attend the Navy firefighting school. Requirements differ based on the length of the cruise and the command relationship. Ensure that this requirement is confirmed or denied before embarkation.

(2) *Class II swimming school.* All personnel must meet the Navy's class II swimming requirements. Certification is a one–time requirement. As with the firefighting school, confirm or deny this requirement before embarkation.

<div align="center">

Appendix J

Forward Arming and Refueling Points

</div>

This appendix describes forward arming and refueling point (FARP) operations. It provides aviation commanders, staff elements, and Class III and V personnel with a comprehensive view of the purpose, organization, and operation of the FARP. It also describes planning consideration for setup of the FARP as well as transportation planning for Class III and V products.

<div align="center">

SECTION I. Introduction

</div>

This section defines the FARP and discusses its purpose. It also discusses planning factors, personnel composition, and the threat. The FARP is vital to the success of the aviation combat mission. Attack, air assault, and support aviation units all depend on the FARP to provide fuel and ammunition where and when they are needed.

J–1. DEFINITION

A FARP is a temporary arming and refueling facility organized, equipped, and deployed by an aviation unit commander to support tactical operations. It usually is located closer to the area of operations (AO) than the combat service support (CSS) area of an aviation unit. It provides fuel and ammunition for aviation units in combat. The fluid situation of the battlefield demands that the FARP be austere, transitory, and able to support specific mission objectives. It should be flexible enough to self–deploy or to be aerially inserted. It must meet the Class III/V needs of mission aircraft. The "FARP" applies only to units with attack/cavalry missions. Aviation units with other missions use these terms: division rapid refueling point (DRRP); brigade rapid refueling point (BRRP); and company rapid refueling point (CRRP).

J–2. PURPOSE

The FARP increases the time on station for the commander by reducing the turnaround time associated with refueling and rearming. FARPs, thereby, give the commander more time to apply continuous pressure on the enemy. They usually are employed when the turnaround time at the unit trains is too long or when time on station must be optimized. They also are employed in support of deep attacks or special operations when the distance covered exceeds the normal range of the aircraft. In addition, FARPs are employed during rapid advances when field trains are unable to keep pace.

J–3. ORGANIZATION

Aviation units are organized under the A–series table of organization and equipment (TOE). Task organizing Class III/V assets for FARP operations may be difficult at the unit level.

J–4. PERSONNEL

a. Personnel allocations for the FARP include four military occupational specialities (MOSs): 77F, 55B, 68J, and 68X. The petroleum specialist, MOS 77F, transports Class III and services aircraft with fuel. The ammunition specialist, MOS 55B, receives and transports Class V munitions from the supply point to the arming point. The ammunition specialist has no aircraft–specific duties; he is responsible for unpacking ammunition. The aircraft armament/missile system repairer, MOS 68J, repairs aircraft fire control systems. He also loads and arms attack aircraft. Besides these three MOSs, the commander should position personnel—medical, battle damage assessment (BDA) teams/maintenance, Stinger teams, and others—as needed.

b. In the heavy division/corps aviation attack battalions, 77F and 55B personnel are assigned to the Class III/V platoon of the battalion HHC. In light divisions, these personnel are assigned to the brigade HHC. In assault and medium lift companies, 77Fs are assigned to the company or to the battalion HHC if a battalion has been formed. The 68J is assigned to the aircraft component repair section of the

aviation unit maintenance (AVUM) company. The commander should be aware that separation from units of assignment can cause command and control (C^2) problems.

c. The increased tempo of operations and/or density of traffic may require air traffic services (ATS) assets. In such cases, the commander or his representative may request a tactical aviation control team from the ATS battalion.

J–5. PLANNING FACTORS

a. Three basic principles must be satisfied when planning a FARP to support aviation units. The FARP must—

    (1) Meet unit mission requirements.

    (2) Provide support throughout the battlefield under all conditions.

    (3) Avoid threat observation and engagement.

b. The intensity of the battle will affect FARP activities. For example, a higher intensity may create a greater need for Class V items than for Class III items. Therefore, aircraft may return to the FARP more often to rearm than to refuel. However, in a reconnaissance scenario wherein aircraft are "hunting" for targets, the need for fuel may be greater than the need for ammunition.

c. A FARP should be set up if the distance between the battle positions and the logistics trains exceeds 30 kilometers (km). Thirty km is a tradeoff distance. A greater distance may leave the commander with inadequate fuel, ammunition, and time on station to complete the mission. The adequacy of roads, availability of higher echelon ground and aviation support, and distance to Class III/V distribution points affect how well the FARP can be supported and sustained.

d. Survivability of the FARP on the battlefield will depend on high mobility and the ability to displace rapidly. Careful site selection, effective camouflage, and minimum personnel and equipment will result in an austere, yet a mission–capable FARP.

J–6. THREAT

An effective way to neutralize the effectiveness of aviation forces is to prevent aircraft from rearming and refueling. Therefore, the FARP will be a high–priority target for the enemy. Class III/V stocks in the AO likely will be subject to nuclear, biological, and chemical (NBC); ground; tactical air; air assault; and artillery attacks. FARP operations may even be harassed by local sympathizers and insurgents.

SECTION II. Command, Control, and Communications

This section discusses the command, control, and communications (C^3) responsibilities of the commander and his staff relative to the FARP. It also includes modes and methods for aircraft control into, within, and out of the FARP. The most difficult aspect of FARP operations is how to command, control, and communicate with other elements in the aviation unit without compromising the FARP.

J–7. COMMAND AND CONTROL

a. *Commander.* The commander is responsible for the overall success of the FARP. Based on the factors of mission, enemy, terrain, troops, and time available (METT–T), the commander decides how his FARP assets will be used to support his operational intent.

b. *S3.* The S3 formulates the commander's plan, which includes the FARP, to accomplish the mission. The S3 consults with the S4 and the HHC commander to ensure that the plan can be supported

logistically.

c. *S4.* The S4 calculates the fuel and ammunition required for the mission and plans the distribution of these supplies. He then coordinates these requirements with higher headquarters.

d. *Class III/V Platoon Leader*. The Class III/V platoon leader is responsible for accomplishing the FARP mission. He also must keep the S4 informed about the amounts of fuel and ammunition on hand.

J–8. AIRCRAFT CONTROL

Control of aircraft within the FARP is critical to safety and overall efficiency of the operation. The proximity of the FARP to the battlefield restricts the use of electronic methods for positive aircraft control. The most effective means of control will be a thorough briefing and a well–written standing operating procedure (SOP) that outlines the FARP procedures to be followed by both aircrews and FARP personnel. In addition, offset, low–output nondirectional radio beacons may be a low–risk method for locating FARPs. Also, various signaling methods may be used to gain procedural aircraft control.

a. *Electronic Signals*.

(1) The use of ATS in a FARP is METT–T–dependent. Under some circumstances, such as during situations other than war, ATS units can provide the aviation commander with a measure of safety and synchronization. A tactical aviation control team can manage the flow of aircraft for a faster, safer, and more efficient operation.

(2) A tactical aviation control team has three soldiers equipped with a lightweight, man–transportable tower and a navigational aid. This equipment can be set up in 20 minutes or less. It provides a low–to–medium, short–to–medium range nondirectional radio beacon (NDB) and secure–voice very high frequency (VHF) amplitude modified/frequency modulated (AM/FM) and ultra high frequency (UHF) AM. The tactical aviation control team deploys from a supporting ATS group or battalion assigned to the division or corps.

b. *Visual Signals.* Visual signals include hand and arm signals, smoke, signal flags, surface–to–air missile (SAM) cards, and light signals. Ground guides will normally control the movement of aircraft within the FARP. Because ground guides may direct allied aircraft, they must use standard hand and arm signals.

(1) Although smoke is not the preferred visual signal, it has several advantages. For instance, it can indicate wind direction. Different colors can indicate the current situation of the FARP or the availability of ClassIII/V products. Smoke also has some disadvantages. For example, it can only be used during the day. It can compromise the location of the FARP. Smoke is not a preferred visual signal.

(2) Flashlights and light wands are other types of visual signals. The flashlight can be used with color–coded disks to relay information. A separate colored disk, which is easily seen at night, can indicate the FARP situation or supply availability. During the day, signal flags of different colors can serve the same purpose. Flashlights can be used with hand and arm signals. However, the use of a light to relay information violates current light discipline policy. Standard light signals are used by North Atlantic Treaty Organization (NATO). Light wands can be used for hand and arm signals as well as to mark departure, landing, and arming and refueling points.

(3) Chemical lights come in a variety of colors to include infrared, which can be seen only through night vision devices (NVDs). They can be used in the same manner as flashlights and light wands. An effective technique for lighting the landing area using chemical lights is to dig a shallow trench in the shape of the landing area and place chemical or beanbag lights in the trench. The landing area can be seen only at a certain angle from the air; on the ground, it is

difficult to see.

(4) Lights should not be kept on in the FARP. They should be turned on or put out just before aircraft arrive and turned off or removed when aircraft leave. This procedure helps avoid enemy detection.

c. *Arming Signals.* In peacetime, the aircrew turns off the anticollision light to signal the ground crew to begin arming. In combat, an alternate signal must be used. During the day, hand and arm signals can be used; at night, the cockpit navigation light may be used. If the 68J is wearing the helmet assembly, rearming refueling personnel (HARRP) (Common Table of Allowances (CTA) 50–900) with communications (HGU–24/P), he can talk with the aircrew.

J–9. TRAFFIC LAYOUT

a. Standard marker panels on departure and arrival points will improve the procedural control of aircraft. Engineer tape, chemical lights, or beanbag lights can be used at night to indicate the desired direction of aircraft movement or the location of ground guides. The aircraft should move to the ground guide's location for arming and refueling. After the aircraft has been serviced, the ground guide should direct it toward the departure end of the FARP. Figure J–1 shows the traffic layout at the FARP; Figure J–2 shows the FARP layout for simultaneous operations.

CAUTION
If marker panels and engineer tape are used, they must be properly secured to prevent foreign object damage to aircraft.

b. Additional aircraft control can be achieved by maintaining integrity of the aircraft section during FARP operations. Selected waiting areas and separate ingress and egress routes also improve aircraft control. As much as possible, the unit safety officer should be involved in planning safe routes in and out of the FARP and establishing checkpoints along the routes.
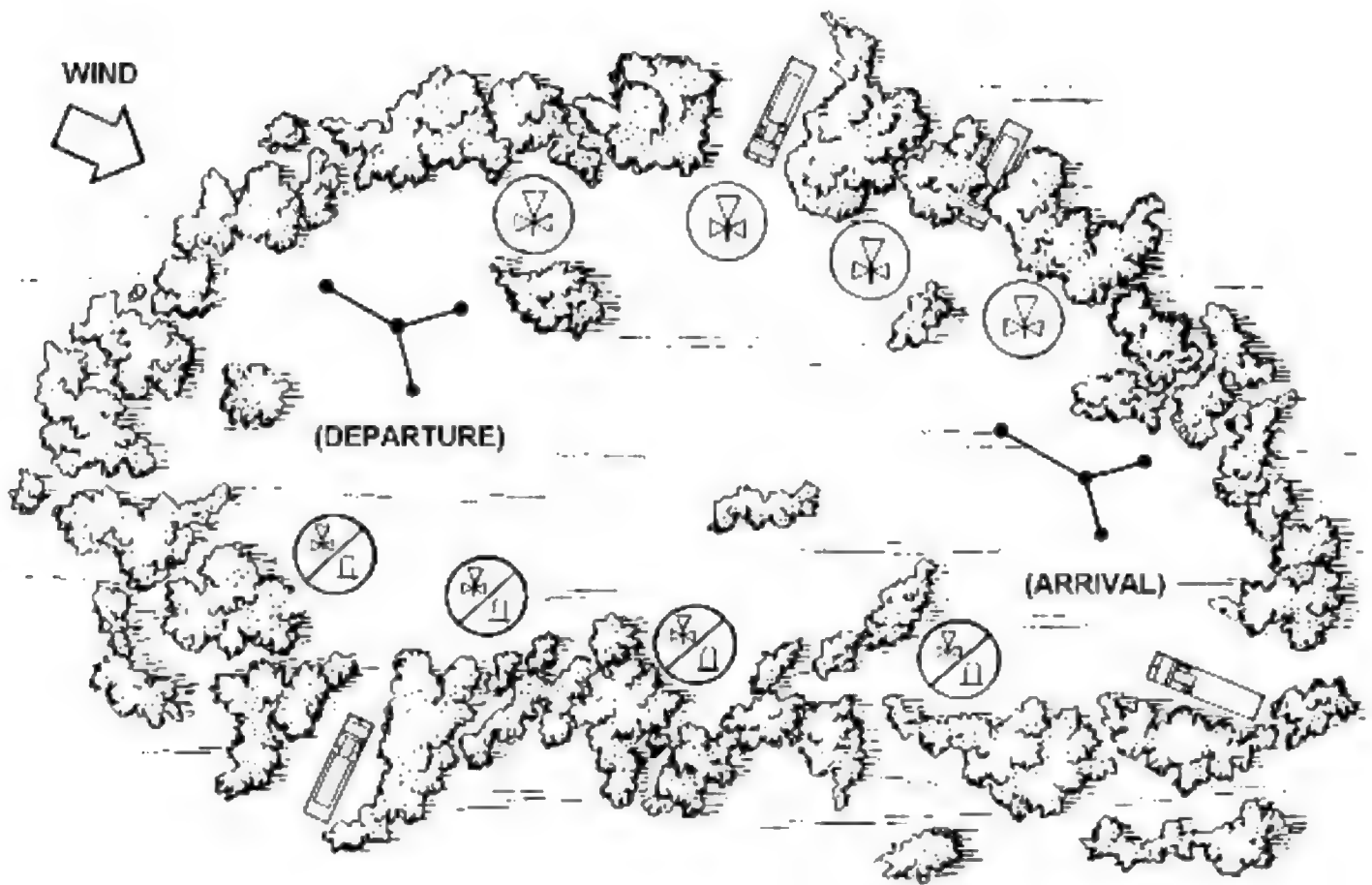
Figure J–1. Traffic layout at a FARP

NOT TO SCALE

BORESIGHT PANEL

HA

SLING LOAD AREA

DISTANCES

MINIMUM	500 METERS
MAXIMUM	5 KILOMETERS
RECOMMENDED	1,200 METERS

STINGERS STINGERS STINGERS 2.75-IN HF 2.75-IN HF 2.75-IN HF 2.75-IN HF 2.75-IN HF

FUEL

OH-58 OH-58 OH-58 AH-64 AH-64 AH-64 AH-64 AH-64/UH-60

FUEL

AMMUNITION HOLDING PIT

AMMUNITION HOLDING PIT

HOT ROCKS/CHEMICAL STICKS OR BEAN BAG LIGHTS

HA

DECONTAMINATION SITE
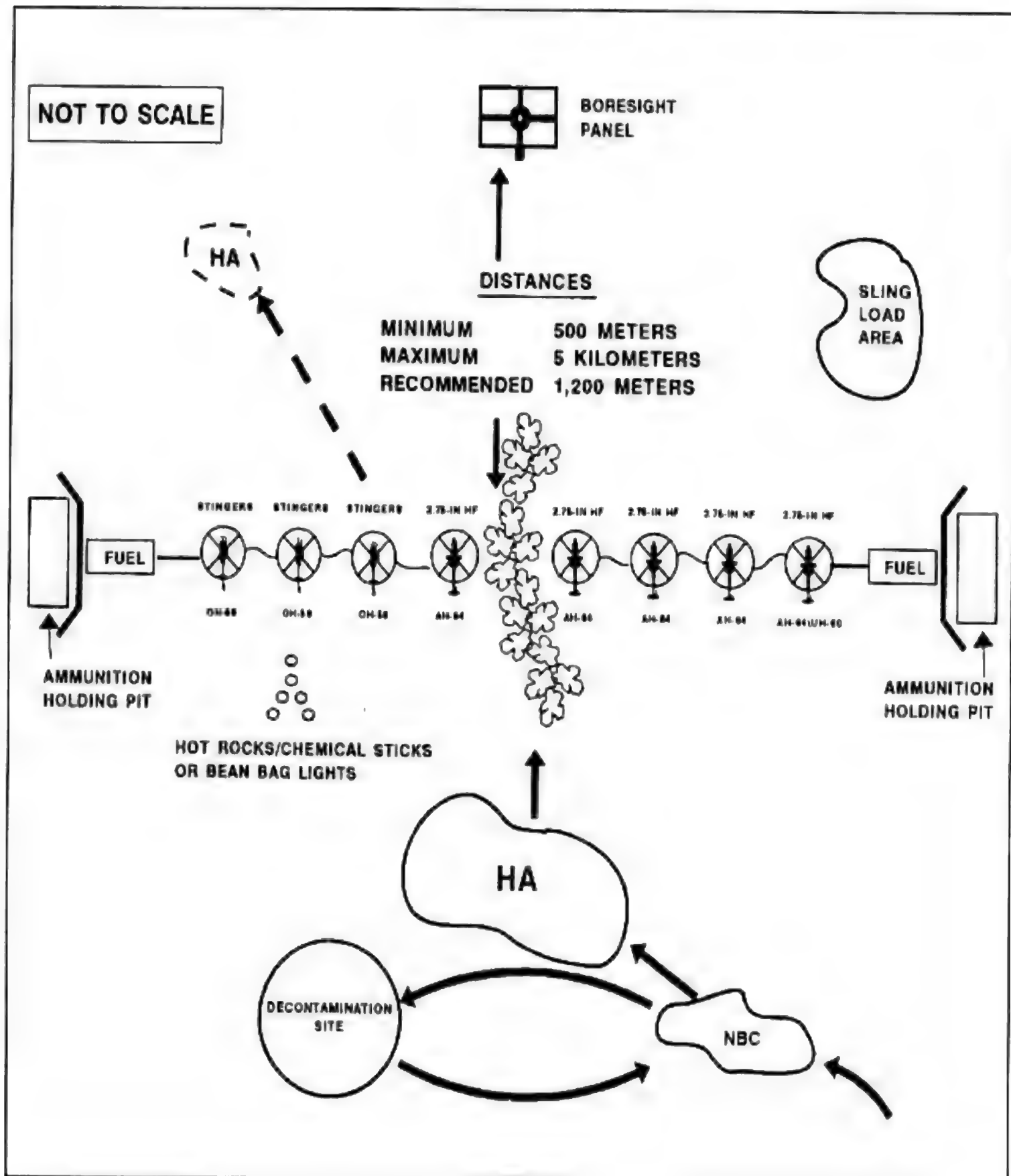
NBC

Figure J–2. FARP layout for simultaneous operations

J–10. COMMUNICATION SIGNALS

a. The use of radios must be kept to a minimum to reduce the enemy's ability to target and engage electronic emissions. However, each FARP should have two FM radios capable of secure voice or secure data burst transmissions. With these radios, FARP personnel can monitor an internal net and a command–designated net—that is, the administration and logistics and the operations and intelligence nets—simultaneously. The internal net would provide FARP personnel with information about the current status of inbound aircraft and ammunition requirements. The command–designated net would provide information that may affect the FARP's operation. A battalion/squadron base FARP should have the communications capability to deploy two "Jump" FARPs.

b. Because FM radios are limited by line–of–sight and range, the distance and/or location of the FARP may prevent FARP personnel from monitoring and/or transmitting on the designated command frequency. In such cases, the use of aircraft as retransmitters is an option as long as the factors of METT–T are considered. These radios should be used to transmit only when—

> **(1)** The FARP is under attack.

> **(2)** The FARP relocates or ceases operations.

> **(3)** The FARP is not operational at the scheduled time.

> **(4)** A request is made to resupply Class III/V products.

> **(5)** The status of the FARP changes. (In this case, the radio is used to report damage or contamination.)

c. Radios are used only after aircraft have left the FARP and then only when necessary. When possible, outbound aircraft should relay critical messages from the FARP to unit headquarters or unit trains. This will help prevent the enemy from electronically pinpointing the FARP's location for attack. FARP reports and other communications should be made in person.

SECTION III. Employment Factors

This section discusses employment factors—location, emplacement, movement plan, security, relocation, site preparation, multiple operations, and damaged or destroyed assets. Class III/V assets are assigned to the headquarters and headquarters company (HHC) of the aviation brigade for light units and aviation battalion HHCs for all other units. The HHC must be prepared to sustain aviation forces with fuel and ammunition during maneuver and combat support missions. The success of the aviation mission is related directly to the effectiveness of the FARP and the personnel who run it. Success depends on planning and coordination before FARP operations begin.

J–11. LOCATION

a. The FARP should be located as close to the AO as the tactical situation permits. It usually is located as far forward as 18 to 25 km (METT–T–dependent) behind the forward line of own troops (FLOT) and within a committed brigade's AO. This distance increases aircraft time on station by reducing the travel times associated with refueling. If possible, the FARP is kept outside the threat of medium–range artillery. Figure J–3 shows the ranges of threat medium–range artillery. Movement and resupply of the FARP is conducted by ground or aerial means. The FARP should remain in one location for only 3 to 6 hours; however, these times may be reduced by the factors of METT–T. The size of the FARP will depend on the number of aircraft that will use the FARP and the type of refueling equipment (FARE or HEMTT) that is available. Four to eight refueling points normally are sufficient.

RANGES (in KMs)

27.5 KMs

130mm FIELD GUN

18 KMs

203mm HOWITZER

17.3 KMs

152mm HOWITZER

15.3 KMs

122mm HOWITZER

9.7 KMs

240mm MORTAR

5.7 KMs

120mm MORTAR

| 27.5 KMs | 22.5 KMs | 17.5 KMs | 12.5 KMs | 7.5 KMs | 2.5 KMs | F L O T |
| 30 KMs | 25 KMs | 20 KMs | 15 KMs | 10 KMs | 5 KMs | |
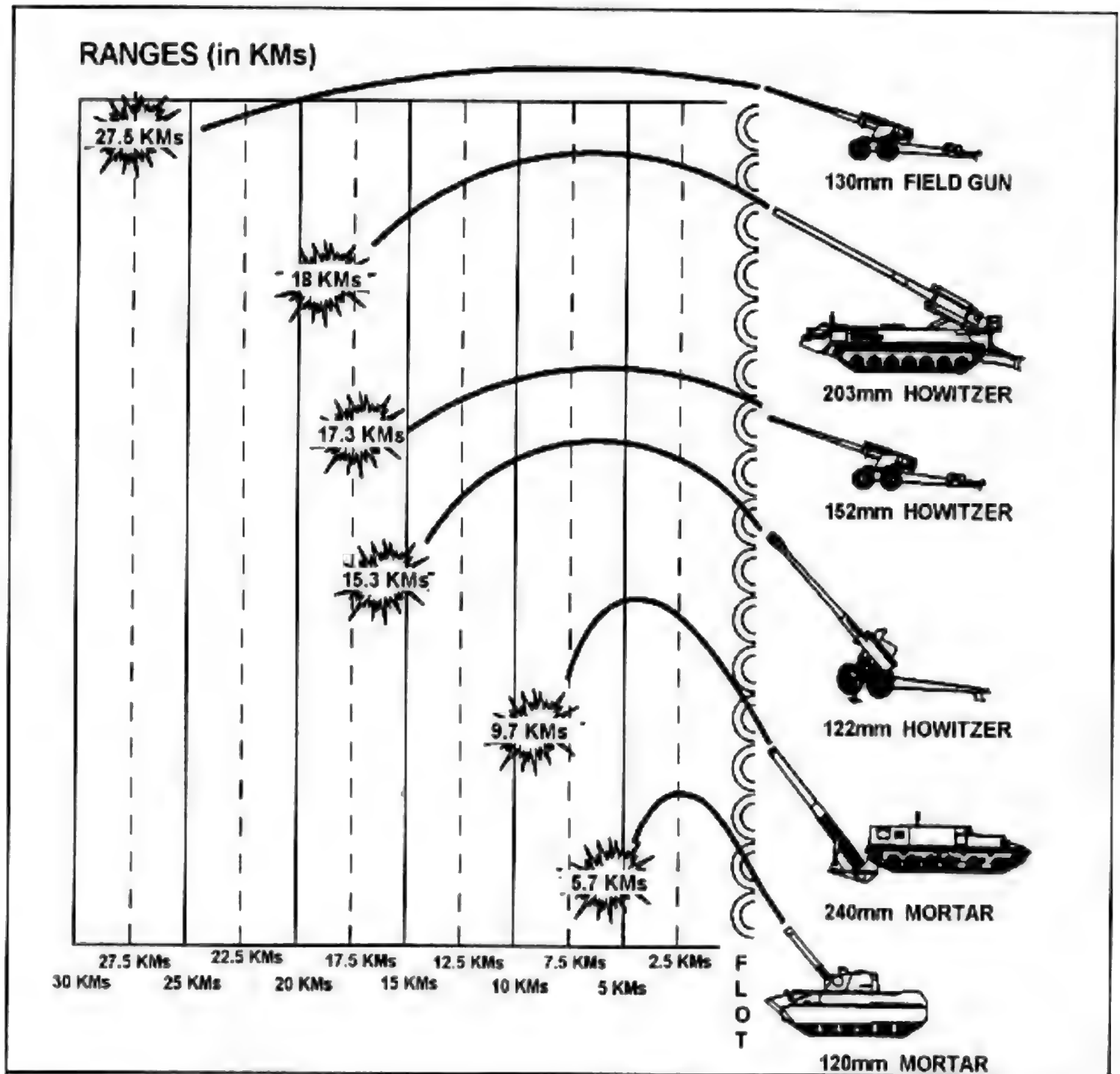
Figure J–3. Threat medium–range artillery

b. Aviation's inherent mobility provides the division commander with a potent force that can move throughout the entire width and depth of the battlefield at the decisive time and place. Aviation's ability to move quickly also requires that the FARP be able to move quickly to maintain support. On the nonlinear battlefield, the battle may initially be fought by aircraft; long–range artillery; and as, necessary, tailored maneuver forces. Seizing the initiative and holding on to it is crucial on the nonlinear battlefield. The tempo of the battle and the long distances involved will increase the demand for aerial resupply. Depending on how much depth is involved, the FARPs either will be austere and mobile—moving often to support the aviation unit—or they will operate out of an airhead. An airhead provides the security that allows the FARP to remain in place for the duration of the battle. A FARP

located in an airhead will have the time and assets to harden itself. Understandably, it will require more personnel to maintain it. Whether the force is fighting in a linear or a nonlinear battlefield, the factors of METT–T will determine location of the FARP.

(1) Mission. Three types of missions are conducted on the linear battlefield: deep, close, and rear. Normally, the deep attack will not need a FARP established behind enemy lines unless the target is extremely large (multiple mission loads) or the mission is lengthy (more than 2 hours). In most other circumstances, deep attack aircraft could rearm and refuel at FARPs within the close area. If a FARP must be located behind enemy lines, the following factors should be considered:

(a) The composition of the FARP should be austere.

(b) Security will be limited because the FARP will be emplaced for a very short time.

(c) A thorough map reconnaissance and intelligence update must be accomplished for the area.

(d) A jump FARP may be necessary if the enemy occupies the roads in the area.

(e) A helicopter with a slingload cannot fly nap–of–the–earth (NOE), which puts it at great risk and broadcasts the unit's intentions.

(2) Enemy. The S2 is responsible for determining the type of threat the FARP is likely to encounter in a certain location. This includes the enemy's capabilities, posture, and weapon systems. For example, a FARP located in the close area may encounter an enemy reconnaissance element. A FARP in the rear area may be the target of special operations forces. The S2 also determines the type of intelligence–gathering devices and sensors that the enemy has oriented at the proposed FARP location.

(3) Terrain. A good FARP location will allow for the tactical dispersion of aircraft and vehicles. Tree lines, vegetation, shadows, and built–up areas should be used to conceal FARP operations. Terrain folds and reverse slopes should be employed to mask the FARP from enemy observation. Ground main supply routes and air avenues of approach must be masked so that the enemy cannot target the FARP visually or electronically.

(4) Troops. The platoon leader must determine if enough troops are available to operate the desired size and number of FARPs and to complete resupply deliveries in the allotted time. Also, the proper personnel skill must be available in the proper numbers. For example, the 68J is school–trained to arm and repair weapon systems. Other personnel at unit level must be cross–trained to fuel aircraft and load weapon systems, but they cannot be cross–trained to perform specific repair functions. Depending on the location of the FARP, the number of soldiers required to provide security will vary. In most cases, the FARP will provide its own security.

(5) Time available. The duration of the mission is a critical planning factor. The longer the mission, the more security and Class III/V products the FARP will require. Planners must consider how long it will take to drive or fly to the proposed FARP site. They must also plan how long it will take to set up a two–point FARE system versus a four– or eight–point heavy expanded mobility tactical truck (HEMTT) system and how far the system is from the supply trains. Driving the HEMTT to and from the supply trains may take too long.

c. The aviation brigade provides the commander with a rapid reaction force that can quickly shift its effort and engage enemy forces in the rear area. Depending on their distance from other supply facilities, aviation units in the rear may require FARP support. A FARP located in the rear will probably remain in one location longer than the recommended 3 to 6 hours. If so, the FARP must be hardened and have adequate security. Movement and resupply of the FARP can be accomplished by ground or aerial means.

d. The versatility of the aviation brigade makes it ideally suited to support sustainment operations. The attack helicopter battalion usually emplaces a FARP using its combat trains. At this site, rearming and refueling operations take place for a specific mission. When that mission is complete, the air assets transition to the field trains FARP site to reconfigure ammunition loads, refuel, and perform the required maintenance in preparation for other missions. Figure J–4 shows a typical disposition of the division aviation brigade and its support assets. Figure J–5 shows a battlefield FARP layout.

e. The brigade (or battalion) rapid refueling point (BRRP) is used by other air assets that require refueling only. The primary purpose of the BRRP is to refuel aircraft as quickly as possible, allowing combat support missions to continue. Rearming operations are not conducted at this site; the BRRP is used only for temporary, specific mission requirements.

f. Stationary in nature, the division rapid refueling point (DRRP) is located in a protected area rear area of the division support area (DSA). It is manned by the aviation support battalion (ASB) or is task–organized within the aviation brigade. At this site, refueling operations are conducted by transient or organic aircraft. The length of DRRP operations usually depends on the factors of METT–T. Rearming operations are not conducted at the DRRP.
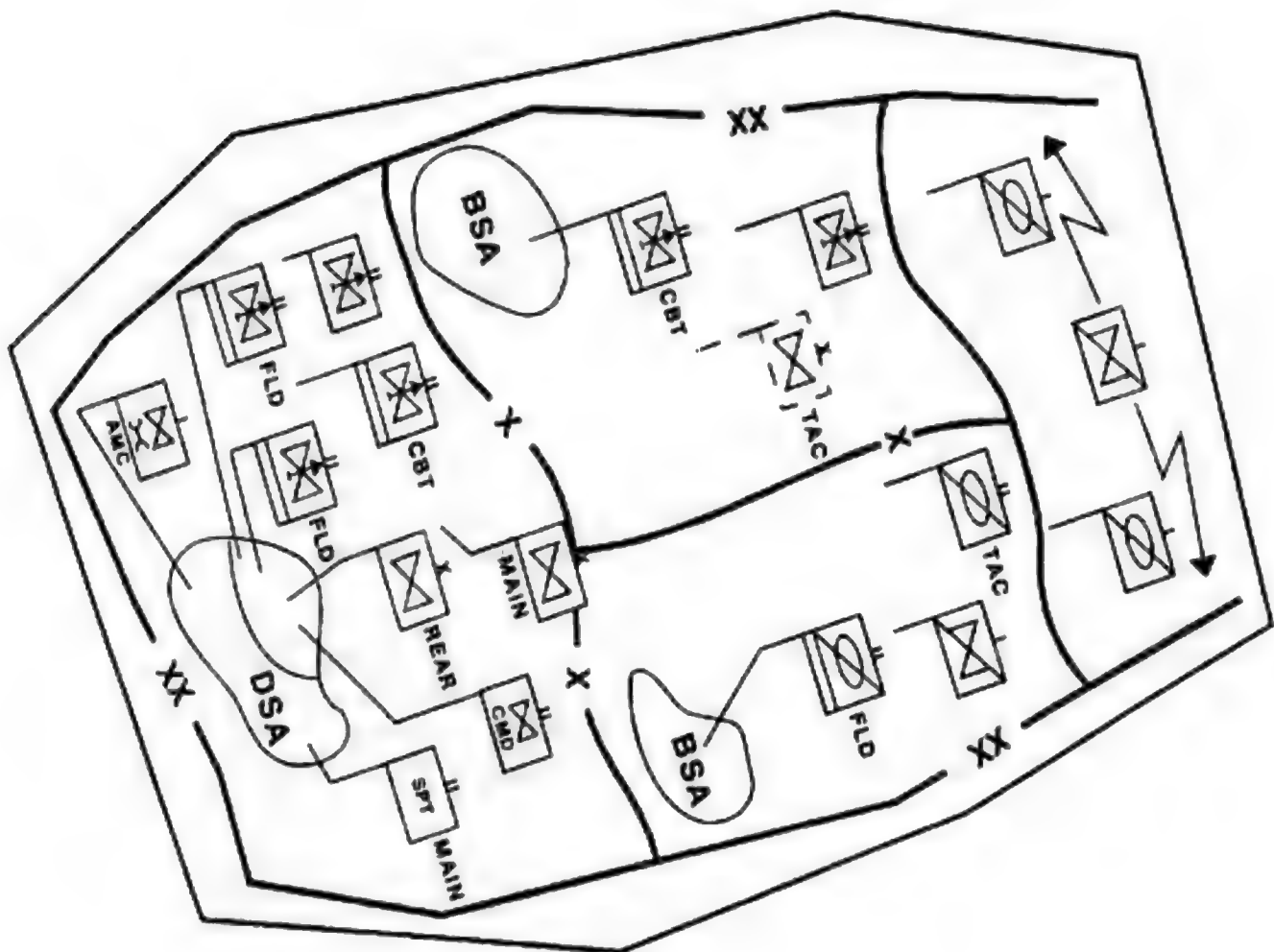
Figure J–4. Typical disposition of the division aviation brigade and its support assets
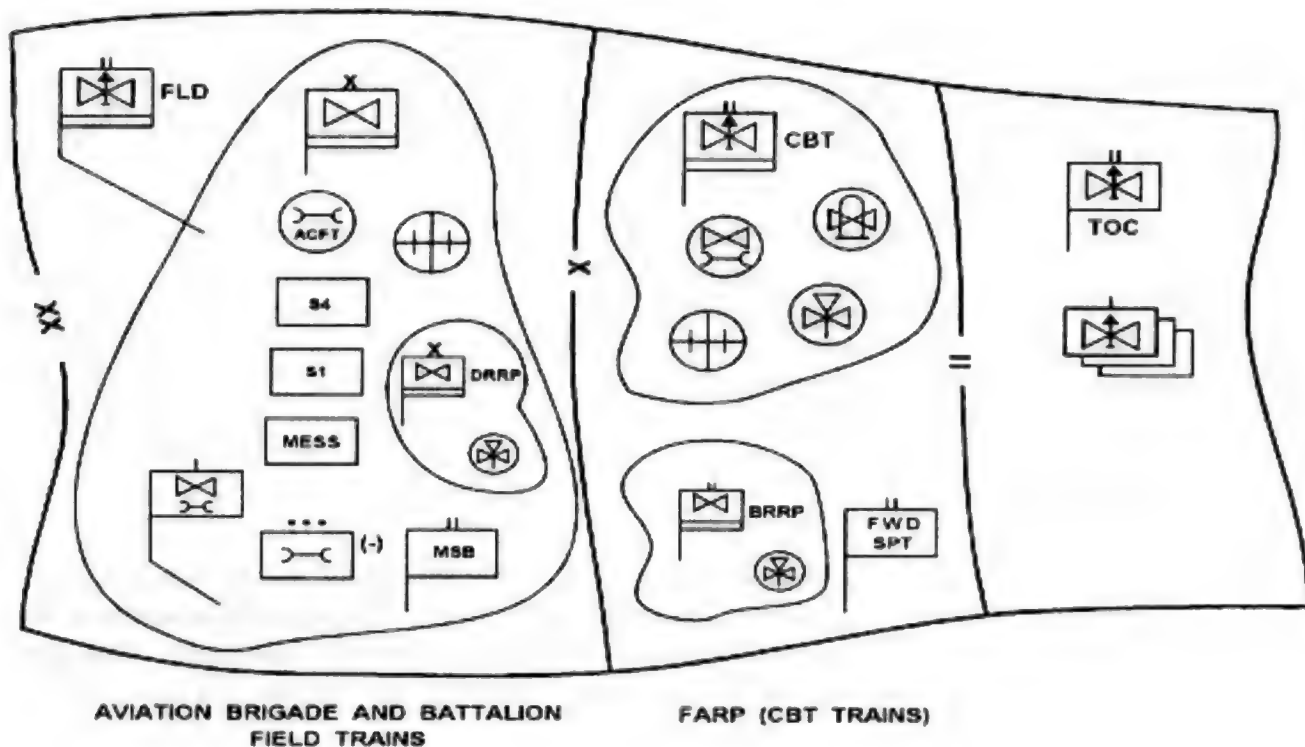
Figure J–5. Battlefield FARP layout

J–12. EMPLACEMENT

a. The FARP can be emplaced either by ground or aerial means. The means of emplacement will depend on the system's mobility, mission aircraft requirements, enemy situation, higher echelon support, and expected operational time. The FARP should be designed so that a trained team can quickly place it into operation. This team should be able to load and move without leaving behind any debris, fuel, ammunition, or equipment. To accomplish this, the FARP should be employed only with those assets it needs for the mission. Section X discusses the emplacement of the FARP by ground or air. Section XI shows an example of a FARP operations annex to a tactical SOP.

b. FARPs are normally emplaced using ground vehicles that carry bulk quantities of Class III/V products. Ground mobility offers the advantages of responsive FARP mobility and the ability to carry large amounts of bulk POL. Ground vehicles are the primary means to displace and resupply the FARP. However, ground–mobile FARPs have several disadvantages. Ground vehicles limit the rapid positioning of FARPs; they are subject to road and traffic conditions. Potential site locations become limited by their vehicular accessibility. Resupply normally is accomplished by the same vehicles transporting the FARP. If a single vehicle is lost, the success of the mission may be jeopardized. Therefore, a backup operation must be planned.

c. Emplacing the FARP by air offers two significant advantages. The first advantage is speed; obviously, a FARP can be moved about the battlefield much faster by air than by ground transportation. The second advantage is that every open field becomes a potential FARP site. Air–emplaced FARPs also have disadvantages. Aerial emplacement of FARPs depends on the availability of supporting aircraft. Rapid displacement is only possible if utility or cargo aircraft are dedicated to support the FARP. If the FARP comes under attack and no cargo or utility aircraft are available, the entire FARP can be lost. If the FARP is contaminated by NBC attacks, it cannot be moved until it has been decontaminated. Otherwise, the commander must accept the contamination of support aircraft and the spread of contamination to clean areas.

d. Resupplying the FARP by air requires dedicated aircraft to move bulk quantities of Class III/V

products. The additional aircraft traffic could compromise the FARP's location, increasing the likelihood of an enemy attack. Aircraft that are slingloading equipment and supplies cannot fly NOE. Therefore, they will be more vulnerable to enemy sensors and radar–directed air attacks. Moving the materiel handling equipment (MHE) also will require dedicated aircraft. Although the MHE can be slingloaded, it may be impractical to use aircraft assets to transport a rough–terrain forklift. However, the absence of MHE can seriously degrade the ammunition–handling and breakdown capability of the FARP.

e. The most efficient use of assets combines ground and air capabilities. When time is critical, the FARE, limited quantities of Class III/V products, and required personnel can be aerially emplaced. The rest of the Class III/V products, MHE, and support personnel can then be moved to the site with ground transportation. The FARP should be aerially resupplied only when the expenditure rate exceeds the organic ground support capability of the unit or when ground resupply routes are occupied by the enemy. Cargo or utility aircraft could temporarily augment ground vehicles until the supply flow returns to normal or the enemy no longer threatens the supply routes.

J–13. MOVEMENT PLAN

a. The movement of the FARP should be planned to include an advance party, march tables, a route reconnaissance, and alternate site locations. Detailed planning of the move will improve the accuracy of the FARP's operational time. Planning should include details about individual vehicle and trailer load plans. Standard load plans do not exist for current equipment because equipment varies in each unit's modification table(s) of organization and equipment (MTOE). Also, the varying Class V requirements for different missions will greatly affect vehicle load plans. Section XII contains suggested load plans.

b. An advance party, equipped with NBC detection equipment, and a security team should be sent to the proposed site to determine its suitability. If the site is not suitable for FARP operations, then time would be available to move the FARP to an alternate location. If the site is usable, the advance party will identify areas for the placement of equipment. When the rest of the FARP personnel and equipment arrive, the advance party should guide each vehicle into its position.

c. Air guards should be posted on vehicles and in dismounted positions to warn of approaching aircraft. They should be rotated often because scanning for long periods dulls an individual's ability to spot approaching aircraft. Vehicle horns are the standard method of warning for an air attack. References.htm#fm9-16">FM 9–16 and FM 55–30 contain additional information on conducting a convoy.

d. In a FARP convoy, the platoon should use concealed routes as much as possible. If the FARP is attacked while moving, vehicles should turn 90 degrees from the direction of the attack. (Aircraft normally attack parallel to the movement of a convoy.) This countermeasure quickly removes vehicles from the line of fire.

e. The advance party may include Stinger assets, NBC attack monitoring and warning equipment and personnel, and crew-served weapons. The first asset that should be employed is the NBC attack monitoring and warning equipment. Monitoring equipment must be placed upwind of the FARP site. Limited antitank capability can be provided by using light antitank weapons. If available, electronic early warning systems should be placed on likely avenues of approach not covered by listening or observation posts. Quick reaction forces may be formed from attack helicopters in or near the FARP. A quick reaction force may also be formed from nonfying members of the unit that have been organized into a reaction team.

J–14. SECURITY

a. The FARP should have enough organic security to defend itself against the anticipated threat. Too much security equipment will hinder the movement of the FARP. However, inadequate security will rob the FARP of its ability to protect itself long enough to move. The unit must coordinate with the

operational brigade responsible for the sector in which the FARP is located for AD and, if necessary, ground security to protect the FARP. Normally, the FARP will be integrated into the brigade's AD umbrella. The supported brigade or division may provide Stinger assets for FARP AD. AD assets must be in positions that protect the FARP from aerial attack. For example, the Stinger should be placed 3 km from the FARP. If the FARP is designated a priority target, then division AD assets—such as Chaparral and other forward area weapon systems—are employed near the FARP. These AD assets should cover friendly ingress and egress routes. Checkpoints should be established for friendly aircraft using the FARP to provide positive identification to AD teams. Stinger assets also should be employed to protect the FARP during convoys.

b. If the FARP is attacked, FARP personnel must be able to execute a scatter plan, which includes movement to rallying points. These points increase personnel survivability and allow personnel to regain control of the situation.

J–15. RELOCATION

a. Several guidelines determine the relocation of a FARP. By definition, the FARP should be temporary, not staying anywhere longer than 3 to 6 hours. (This is true unless it is hardened and located in a secure area such as an airhead.) When the battle lines are changing rapidly or when the rear area threat dictates, the FARP must be moved often. In a static situation, frequent movement of the FARP may not be necessary. Where air parity or enemy air superiority exists, the FARP must be moved often. The FARP should be moved only after it fulfills the support requirements of mission aircraft.

NOTE: If NBC contaminants exist, equipment should be decontaminated before it is moved from the FARP site.

b. A FARP may be relocated for any of the following reasons:
- The FARP comes under attack.
- The order to relocate is received by radio.
- A face-to-face message is received to relocate.
- A preplanned relocation time has been set.
- A preplanned relocation occurs after a specific event; for example, after the FARP has serviced a specific company or a specific number of aircraft.
- The last element to use the FARP delivers the message to relocate it.
- A decision or trigger point is used.

c. The message to relocate a FARP is passed in fragmentary order (FRAGO) format and will contain, as a minimum, the following information:
- Eight–digit grid coordinate of the next site and alternate site.
- Time the FARP is to be mission ready.
- Fuel and ammunition requirements.
- Passage–of–lines contacts, frequencies, call signs, and ingress and egress points.
- Enemy situation at the next site.
- March table or movement overlay.
- A logistics release point (LRP) to the FRAGO.

d. If time allows, a map reconnaissance and a survey of the proposed site should be conducted before a FARP site is selected. A site survey is critically important; maps may not be current and sites are not always as they are depicted on the map. For example, an open field on a map may actually be overgrown with trees.

e. Once ordered to relocate, the FARP elements should begin an orderly movement. After the FARP has been moved, no evidence should remain that the area was ever occupied.

(1) *Advance party actions.*

(a) The advance party breaks down one unit, consisting of one HEMTT or one FARE. Next, it rolls up and packs hoses and refuels the tanker if fuel is available. The advance party then transports, when possible, enough ammunition for two mission loads per aircraft, rolls up the camouflage nets, and sets up a convoy.

(b) When the convoy is ready, the advance party moves out to the new location. Upon arrival, personnel establish security, conduct an NBC survey, reconnoiter the site, and perform other tasks outlined in the unit SOP and the applicable Army training and evaluation program (ARTEP) publication. If the site is unsuitable or the enemy is nearby, the advance party reports this information to the TOC. The advance party then requests to move to the alternate site and notifies the remaining FARP elements. When the site is deemed suitable, the advance party—

- Determines the landing direction.
- Determines and marks refuel and rearm points, truck emplacements, and ammunition emplacements.
- Sets up the equipment.

(2) *Remaining FARP element actions.* The remaining FARP elements break down the remaining points in the same way and sequence as described above. When personnel arrive at the new site, they move into new locations as directed by the advance party and set up the arming and refueling points.

J–16. SITE PREPARATION

a. The FARP site will be policed before operational use. Sticks, stones, and other potential flying objects should be removed to prevent injury to personnel or damage to equipment. The rotor wash from a helicopter can cause these objects to become hazards. In addition, scrub brush, small trees, or other vegetation may need to be cleared from landing and takeoff areas. The use of predesignated landing, takeoff, and hovering areas will minimize accidents, incidents, or injuries. The areas around the rearming and refueling points and the pump assemblies should be cleared of dried grass and leaves to prevent potential fires.

b. Aircraft may sink in wet, snow–covered, thawing, or muddy ground. Pierced steel planking or other suitable material, staked to the ground, can be used to reinforce the ground.

J–17. MULTIPLE OPERATIONS

a. The degree of air superiority and the factors of METT–T will determine the number of FARPs and the number of refueling points at each FARP. Multiple FARP operations may be necessary. To accomplish this, assets should be arranged to set up two or three independent and mobile FARP operations. The ideal situation would include active, silent, and jump FARPs.

(1) The active FARP is conducting refueling and rearming operations. The silent FARP has all equipment and personnel at the future site, but it is not operational. The jump FARP is employed for a special mission. It is composed of a FARE, 500–gallon collapsible fuel drums, and/or ammunition (as the mission dictates). The jump FARP is transported and emplaced by ground or air and employed when dictated by time or geographical constraints. It allows the uninterrupted support of attack elements during FARP relocation and resupply.

(2) The mode of transportation is determined by the availability of assets and the urgency of the

mission. No FARP should stop operation until another FARP becomes operational unless the tactical situation demands otherwise. Splitting Class III/V personnel and equipment into three independent FARPs will be difficult. The organization of each FARP will depend on the mission and the way the commander wants to employ his FARPs. Section XI describes multiple FARP operations.

b. The timing of supplies must be coordinated when multiple FARPs are used. If Class III/V supplies are being pushed forward, the FARP should stop receiving supplies at a designated time. The time should be based on estimated Class III/V usage rates and should allow the FARP to use all of its supplies. Any Class III/V products not used should be transported to the new site. Otherwise, the supplies should be camouflaged and picked up later. The supplies should be destroyed only as a last resort. TM 750-244-3 provides guidance on the destruction of assets.

c. A typical ground-emplaced mobile FARP consists of a HEMTT tanker aviation refueling system, a HEMTT cargo truck with trailer, and a HMMWV or commercial utility cargo vehicle (CUCV). This mobile FARP can rearm and refuel four aircraft simultaneously. The HMMWV is used to lead vehicles to planned FARP locations. When the mobile FARP requires additional Class III or Class V products, it may proceed to the battalion trains area for resupply or it may be aerially resupplied.

J-18. DAMAGED OR DESTROYED ASSETS

a. Once the location of the FARP has been compromised, the site must be vacated. The nature of the compromise will determine what can be taken from the site. The refueling equipment must be saved if possible. Without the FARE, getting the fuel out of storage tanks and tankers into aircraft will be difficult. The 5,000–gallon semitrailer and HEMTT tankers have the capability to remove fuel from storage containers.

b. Damaged or destroyed assets must be replaced quickly, or the unit's mission may be disrupted. The chain of command must be notified at once of any change in operational status. The HHC commander must report injuries to personnel and damage to vehicles, equipment, and supplies to the S4 by the quickest means possible. Replacement items should be sent to the requesting FARP as soon as possible. If the assets are not available in the unit, emergency support may be available from other brigade sources. This support could range from borrowing equipment to using another battalion's FARP. Unit elements must be informed of any changes in the status of the FARP sites to include alternate arming and refueling instructions.

c. Equipment or products to be saved must be prioritized before the mission starts; all FARP personnel must be informed of the priorities. For example, keeping Hellfire missiles from the enemy would be a high priority because the missiles are expensive and in short supply.

SECTION IV. Refueling Operations

This section discusses forward area refueling equipment (FARE), the FARE site layout, support equipment, personnel refueling requirements, and refueling methods.

J-19. FORWARD AREA REFUELING EQUIPMENT. Equipment at the refueling site for the FARE system (NSN 4930-00-133-3041) consists of a pump assembly, a filter/separator, hoses, nozzles, grounding equipment, and valves defined below. Other support equipment, which is not a component of the FARE, includes the fuel source and the fuel sampling kit.

a. *Pump assembly.* This pump has two hose connections and is rated at 100 gallons per minute (GPM). When two hoses are used, actual flow rate may be as low as 50 GPM.

b. *Filter/separator.* The filter/separator provided with the FARE is rated at 100 GPM. It has a working

pressure of 75 pounds per square inch (psi).

c. *Hoses, nozzles, grounding equipment, and valves.* This equipment must be available to support the FARE setup that is envisioned; that is, the one-point or two-point setup.

d. *Support equipment.* Support equipment includes items such as fire extinguishers, grounding rods, waste cans, 5-gallon water cans, and absorbent material. The FARE system without a fuel source weighs 840 pounds and occupies 64 cubic feet.

(1) *Fuel source.* The fuel source is usually 500-gallon collapsible drums. However, other sources may be used. They include 600-gallon pods; 1,200-gallon tank and pump unit (TPU); 3,000– or 10,000-gallon collapsible tanks; 2,500-gallon HEMTT tanker; 5,000–gallon semitrailer; railroad tank cars; and fuel tanks of an US Air Force (USAF) cargo plane.

(2) *Fuel sampling kit.* The model that should be used is Aqua–Glo Series III (NSN 6630-00-706-2302).

J-20. FARE SITE LAYOUT. Skilled, experienced personnel can set up a FARE within 15 minutes of its delivery to a site. The ammunition portion of the FARP can be set up within 45 minutes of delivery to a site. This time includes the unpacking of ammunition.

a. The setup of the FARE system should take advantage of terrain features, achieve maximum dispersion, avoid obstacles, and accommodate the type of aircraft the FARP will service. When planning the layout of the FARE system, personnel must consider the minimum spacing required between aircraft during refueling. The spacing will depend on the type of aircraft and its rotor size. Proper spacing reduces the possibility of collision and prevents damage caused by rotor wash. The minimum rotor hub to rotor hub spacing for all helicopters is 100 feet.

b. If the area has a prevailing wind pattern, the refueling system should be placed at a right angle to the wind. Thus, helicopters can land, refuel, and take off into the wind. The refueling points also should be laid out on the higher portion of a sloped site, not in a hollow or valley. Fuel vapors are heavier than air; they flow downhill. Also, the fuel source should be kept downwind of the aircraft's exhaust to reduce the explosion hazard. These same considerations apply to any FARP set up with the FARE; 5,000-gallon semitrailer tanker; or HEMTT. Aircraft movement should be limited in desert and snow environments where wind and rotor wash may cause brownout or whiteout. Special considerations will be necessary when aircrews are operating with night vision devices. Figure J-6 shows a FARE setup under various wind conditions.

MAIN ROTOR TIP TO TAIL ROTOR TIP

OH-6	30' 3"
OH-58	40' 11"
AH-1	52" 11"
UH-1	57'
AH-64	57' 8"
UH-60	64' 10"
CH-47	59' 1" / 98' 3" / 59' 1"

WIND DIRECTION

WIND DIRECTION

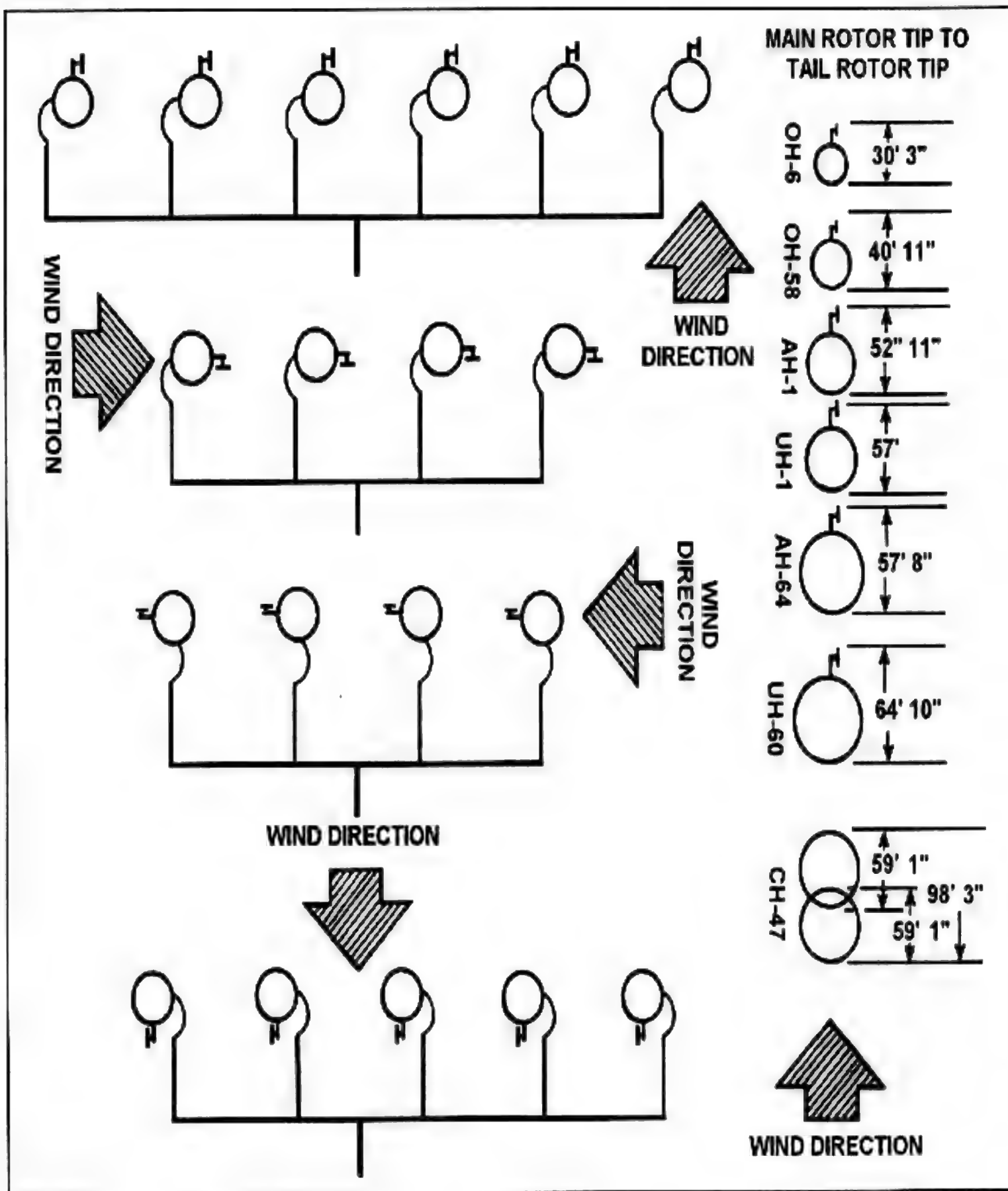WIND DIRECTION

WIND DIRECTION

WIND DIRECTION

Figure J-6. FARE setup under various wind conditions

> **WARNING**
>
> As an aircraft moves through the air, static electricity builds up on it. Static electricity also builds up on the refueling equipment when fuel is pumped through the hoses. The aircraft, fuel nozzle, and pump assembly must be grounded to prevent sparks and explosions. Static electricity buildup is greater in cool, dry air than in warm, moist air.

J–21. SUPPORT EQUIPMENT

a. A fire extinguisher must be located at each refueling nozzle and at the pump and filter assembly. A water can and waste fuel pan should be located at each refueling point. This would enable operators to wash fuel off skin and clothes, wash dirt off fuel nozzles, and contain fuel if a spill occurs.

b. A waste fuel pan is required to limit fuel spillage. Fuel spills will be recovered; contaminated soil will be dug up and placed in containers. The containers will be disposed of according to the unit SOP. If the spillage is 50 liters (13.2 gallons) or more, the local facility engineers must be notified. The spillage will also be reported to the environmental protection person, who will determine the actions necessary to retrieve the spillage.

c. Unit SOPs will include a waste fuel plan for all refueling operations during peacetime. FM 10–68 and Section IX contain more information on fuel spills.

J–22. PERSONNEL REFUELING REQUIREMENTS

a. Three persons are required to refuel an aircraft. One person operates the fuel nozzle, the second remains at the emergency fuel shutoff valve, and the third mans a suitable fire extinguisher. The third person stands outside the main rotor disk of the aircraft at a point where he can see both the pilot at the controls and the refueler with the nozzle. This person may be from the FARP or one of the aircraft crewmembers. In a combat situation, METT–T may override the availability of a third person to operate the fire extinguisher.

b. The refueler must wear protective clothing. This consists of a uniform, a helmet, goggles, hearing protection, gloves, and leather boots. Each item is discussed briefly below.

> **(1)** *Uniform.* A serviceable fire retardant flight suit or battle dress uniform will be worn with the sleeves rolled down.
>
> **(2)** *Helmet.* The HARRP (CTA 50-900) is the authorized helmet. Two versions are available for issue: the HGU-24/P (communications-equipped) and the HGU-25/P (aural protector only). The helmets are provided in four hat sizes and include eye protection. The cranial impact shells are available in seven different colors; they can be used to differentiate between the functions of personnel in the FARP; for example, POL, ammunition, medical, and maintenance personnel). The decision to use different colored cranial impact shells will depend on the factors of METT–T. If the HARRP is not available, a motorcycle helmet, a flight helmet, a kevlar helmet, or an infantry helmet is acceptable.
>
> **(3)** *Goggles.* Sun, wind, and dust goggles (CTA 50-900) will be worn if the HARRP or flight helmet is not available.
>
> **(4)** *Hearing protection.* Earplugs, ear protectors, or both will be worn.
>
> **(5)** *Gloves.* Gloves must be worn at all times during refueling operations. If they become saturated with fuel, they should be replaced. CTA 50-900 lists specific gloves that are authorized

for refueling operations.

(6) *Leather boots.* The standard rubber-soled, leather combat boots will be worn. Boots will not have heel or toe taps or cleats. Any metal on the sole, to include exposed nails on a worn-down sole, could cause a spark on contact with a hard surface. Fuel vapors are heavier than air; a spark at ground level could cause a fire.

WARNING

Entering a warm room wearing fuel-soaked clothing can be dangerous. The chance of a fire starting because of static electrinicty is increased.

---

c. If a fuel handler's clothes become soaked with fuel, the fuel handler should

- Discontinue the refueling operation and leave the area immediately.
- Wet clothes with water before taking them off. (If water is not available, the fuel handler should hold onto a grounding rod to prevent sparks when removing his clothes.)
- Wash fuel off the skin with soap and water as soon as possible.

J-23. REFUELING METHODS

Refueling can be accomplished with the aircraft engines running (hot or rapid refuel) or with the engines off (cold). In a field environment, a unit will normally use the "hot" refueling method. The one hot method of refueling an aircraft is closed-circuit refueling (CCR). CCR is accomplished with a nozzle that mates with and locks into the fuel tank. This connection prevents fuel spills and vapors from escaping at the aircraft fill port and reduces fuel contamination.

NOTE: POL handlers should be aware that the rate at which fuel is pumped differs with each type of aircraft.

a. *Open-Port Refueling.* Open-port refueling is accomplished with an automotive type nozzle, which is inserted into a fill port of a larger diameter. It is not as fast nor as safe as closed-circuit refueling (CCR). The larger port allows fuel vapors to escape. Also, airborne dust, dirt, rain, snow, and ice can get into the fill port during refueling; therefore, the quality of the fuel could be lowered. Spills from overflowing tanks also are more likely. Rapid refueling by the open-port method is restricted to combat or vital training. In these cases, the aviation unit commander makes the final decision. Simultaneous arming and open–port refueling activities will only be conducted when the combat situation and benefits of reduced ground time outweigh the risks involved.

b. *Closed–Circuit Refueling .* CCR is accomplished with a nozzle that mates with and locks into the fuel tank. This connection prevents fuel spills and vapors from escaping at the aircraft fill port and reduces fuel contamination.

(1) The Army has two systems: the closed-circuit refueling system and the D-1 pressure system (also called the centerpoint system). The D-1 pressure system components, except for the receiver, are mounted on the M970 (5,000-gallon semitrailer tanker) and M978 HEMTT (2,500-gallon tank vehicle). The UH-60, AH-64, and CH-47 are equipped to use the D-1 nozzle.

(2) The main difference between the CCR nozzle and the D-1 nozzle is that the D-1 nozzle provides a higher fuel flow rate. Also, the CCR nozzle can be adapted to open-port refueling; the D-1 nozzle cannot. The CCR nozzle is 2 inches wide; the D-1 nozzle is either 2 1/2 inches or 3 inches wide. The CCR provides 100 GPM compared to 150 to 200 GPM for the 2 1/2-inch D-1 nozzle and 300 GPM for the 3-inch D-1 nozzle.

NOTE 1: The pilot is normally responsible for signaling the refueler when to stop refueling the aircraft. In AH-series aircraft, the pilot is responsible for monitoring the fuel gauge.

NOTE 2: A 15-psi differential return pressure restricts the fuel flow rate of the AH-64 to 56 GPM during closed-circuit refueling.

Appendix K

Army Special Operations Aviation

This appendix provides a basic overview of Army Special Operations Aviation (ARSOA). FM 1-108 contains detailed information on ARSOA.

K–1. INTRODUCTION

ARSOA is an integral part of special operations (SO). ARSOA units plan and conduct air operations in all operational environments across the spectrum of conflict. They are specially trained and equipped to conduct SO as part of an Army special operations task force (ARSOTF) or joint special operations task force (JSOTF). To employ this force properly, commanders must understand the basic characteristics of SO in general and ARSOA in particular. ARSOA provides the commander a means to infiltrate, resupply, and exfiltrate Army special operations forces (ARSOF) engaged in all core missions and collateral activities.

K–2. MISSION

ARSOA—

a. Plans, supports, and conducts special air operations.

b. Clandestinely and covertly penetrates hostile and denied airspace.

c. Supports special operations forces (SOF).

d. Conducts joint, combined, interagency, and coalition operations in regional crises, major conflicts, or as directed by the National Command Authorities (NCA).

e. Organizes, equips, trains, validates, and employs assigned aviation units for the US Army Special Operations Command (USASOC).

K–3. CAPABILITIES

a. ARSOA units are trained and equipped to infiltrate, resupply, and exfiltrate US Special Operations Forces (USSOF) and other designated personnel. Training is specifically tailored to profiles that support the SOF mission. ARSOA units prefer to operate at night. They use night vision goggles (NVG) or night vision systems (NVS) and low–level flight profiles. They conduct training in all operational environments and terrain: desert, mountain, jungle, urban, and over water. Inherent in the training is the ability to operate from maritime platforms. Training emphasizes precise navigation over long–range and under adverse weather conditions.

b. ARSOA aircraft are modified to add the capability for aerial refueling; they are modified to enhance precise navigation, secure communications, long–range flight performance, and increased weapons lethality. The enhancements give ARSOA the unique capability to take advantage of adverse weather, limited visibility, or low ceilings. These conditions provide concealment for air operations; they help achieve surprise. Organic attack helicopter aircrews are specifically trained to provide close air support (CAS) and terminal guidance for precision munitions and support of SOF.

K–4. LIMITATIONS

a. ARSOA has a limited CS and CSS capability. Standard supply and requisition systems, field service, maintenance, transportation, and medical resources and activities of the air support

coordination center (ASCC) can meet the majority of ARSOA logistic requirements. ARSOA, however, has unique limitations uncommon to other general purpose (GP) aviation units and ARSOF.

b. ARSOA is not equipped or manned to—

(1) Provide its own food service or water storage; it requires food service 24 hours a day because of varied aircrew schedules.

(2) Secure its aircraft or operating base; it must operate from a secure base and airfield.

(3) Effect its own integration into the airspace control system; it requires support or augmentation for airspace deconfliction and tactical air support coordination.

(4) Accept supply point distribution or to conduct moves because it does not have the ground support assets necessary to accept supply point distribution or to conduct moves; it requires the unit distribution method of resupply and ground transportation support to conduct unit moves.

c. ARSOA is not equipped to provide sufficient billeting for its personnel; it requires climate–controlled facilities that must be compartmented and lighted to accommodate varied aircrew schedules.

d. ARSOA is not equipped, manned, or apportioned to the theater in sufficient quantities to provide even its own aerial resupply or to conduct its own unit movement; it requires GP aviation aerial resupply and aerial movement support.

e. ARSOA requires stove–pipe requisition and distribution systems for resupply of ARSOA–peculiar Class II, V, and IX items; resupply of these items cannot be met through normal requisition and distribution systems.

f. ARSOA personnel and equipment are not easily regenerated.

K–5. ORGANIZATION

a. ARSOA consists of an Army special operations aviation regiment (SOAR)—the 160th SOAR(A) (Figure K–1). The regiment consists of a headquarters and headquarters company; a separate, forward–deployed combat assault company; three combat assault battalions; a special operations aviation training company; and a systems integration and maintenance office.

b. The ARSOA regiment's rotary–wing aircraft include the AH/MH–6 Cayuse; the MH–60 Blackhawk; the MH–60 variant, known as the direct action penetrator (DAP); and the MH–47 Chinook. ARSOA units are designed to plan, conduct, and support SO missions unilaterally or jointly in all theaters and all levels of conflict. To accomplish this mission, ARSOA units are task organized according to the unit they will support, the theater of operations, and expected missions. ARSOA task organizations are formed around one of the assault battalions.

160th SPECIAL OPERATIONS
AVIATION REGIMENT (ABN)
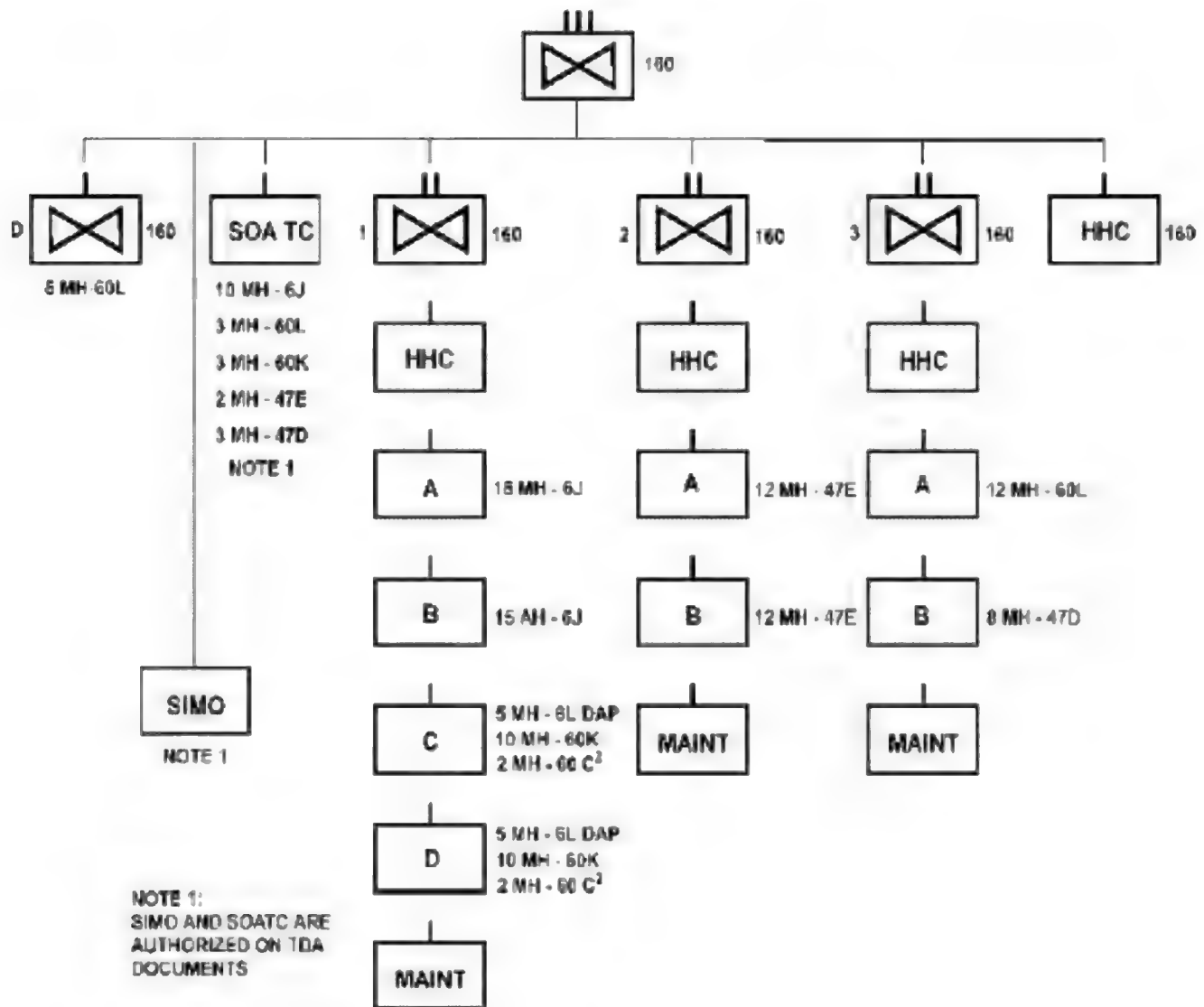
Figure K–1. Special operations aviation regiment (A) (–)

K–6. COMMAND AND CONTROL

a. ARSOA may be organized under varied command and control (C^2) relationships. It requires a responsive and unified C^2 structure that must be clear and well defined. This structure must delineate who is in operational control of the unit and who provides the required support. A clear, responsive command structure enhances mission response time and operational security (OPSEC). Excessive C^2 layering must be avoided.

b. Regardless of the C^2 structure, the relationship must—

(1) Provide for a clear and unambiguous chain of command.

(2) Provide for sufficient staff experience and expertise to plan, conduct, and support the operations

(3) Delineate support channels.

(4) Ensure ARSOA personnel are employed in the complete planning process. Personnel conducting the mission must be thoroughly familiar with all operational and support requirements to match capabilities with those of the employed force.

K–7. COMMAND AND CONTROL ORGANIZATIONS

a. ARSOA may be task organized under—
- A joint force commander (JFC).
- A joint force air component commander (JFACC).
- A joint force special operations component commander (JFSOCC).
- A joint special operations air component commander (JSOACC).
- A joint special operations task force (JSOTF).
- An Army special operations task force (ARSOTF).

b. Doctrinally, ARSOA is not operationally or tactically controlled by GP forces. Normally, it is operationally controlled by a JSOACC or JSOTF (Figure K–2). When organized under the ARSOTF, no agency is identified to provide liaison with the JFACC. These functions must be provided by the ARSOTF staff or a special operations liaison (SOLE) provided by the JFSOCC. To clarify ARSOA's command relationships, the following definitions are provided:

c. The JFACC is normally the service component commander who has the preponderance of air assets to be used and the ability to C^2 these assets. The JFC, who defines the JFACC's authority and responsibilities, designates the JFACC's responsibilities included, but not limited to, planning, coordinating, and allocating assets based on the JFC's apportionment decision.

d. The JFSOCC designates the JFSOCC. The JFSOCC designates, as the JSOACC, the service commander who either has the preponderance of the SO aviation force or is most capable of conducting, commanding, and controlling operations within a given environment. The JSOACC is a subordinate commander within the SOC. His responsibilities parallel those of the JFACC but within the confines of SO. He also is responsible for deconflicting and coordinating SOA with conventional air operations. A JSOTF may also have a JSOACC designated. Again, it is normally the subordinate commander with the preponderance of special operations aviation (SOA) assets or most capable of providing C^2 The responsibilities of a JSOACC in a JSOTF are the same as when working for a JFSOCC.

ARMY SPECIAL OPERATIONS AVIATION TASK FORCE C² ARRANGEMENT

```
      ┌─────────────┐                          ┌─────────────┐
      │   JSOTF     │                          │   ARSOTF    │
      └─────────────┘                          └─────────────┘
            :    └──────────────┬──────────────────┘
            :                   │
      ┌─────────────┐           │
      │   JSOACC    │           │
      └─────────────┘           │
            :                   │
            : . . . . . . . .   │
                            :   │
                      ┌─────────────┐
                      │  ARSOA TF   │
                      └─────────────┘
```
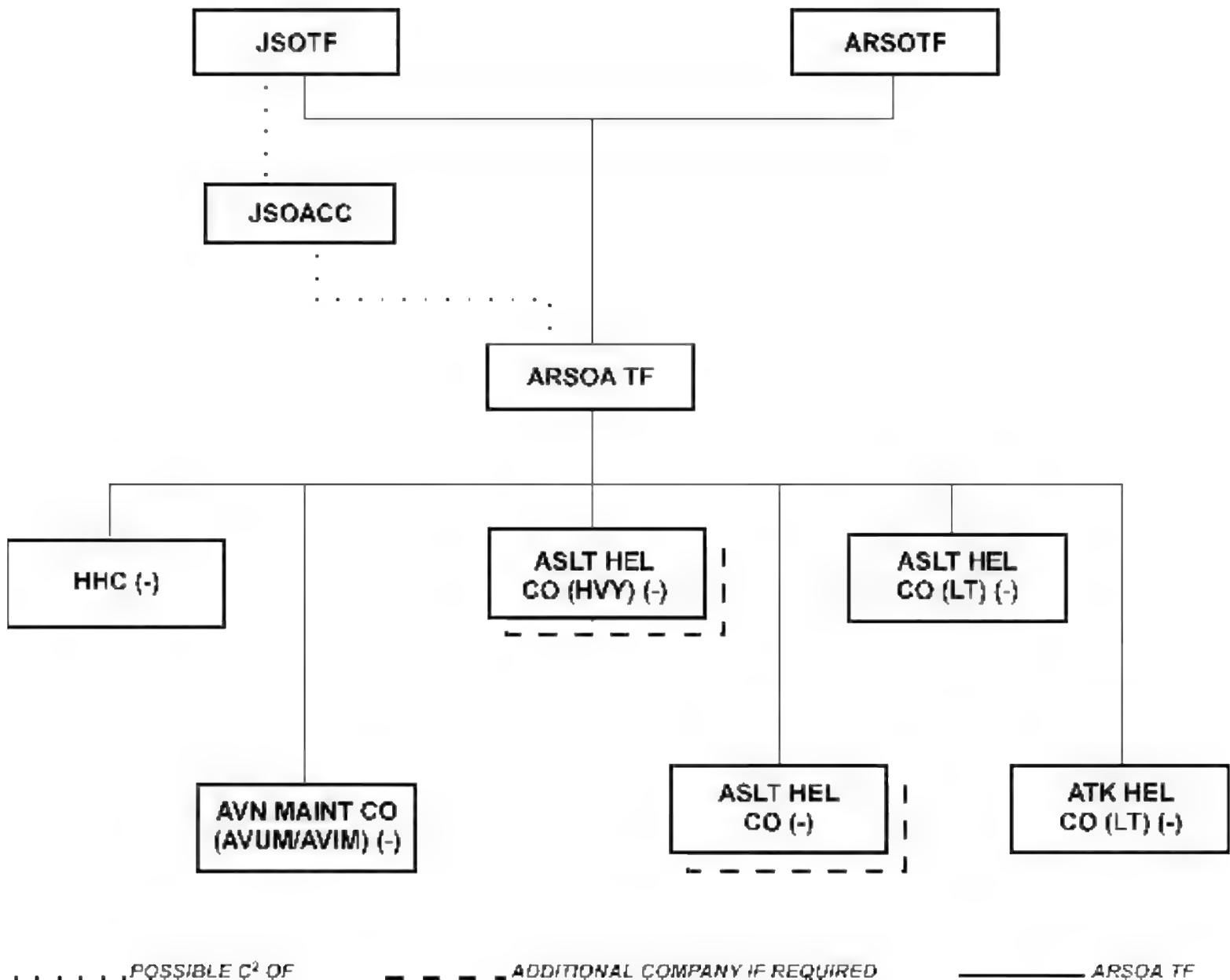
Figure K–2. ARSOA task force C²

Legend: POSSIBLE C² OF — — — ADDITIONAL COMPANY IF REQUIRED ———— ARSOA TF

Boxes under ARSOA TF: HHC (-), ASLT HEL CO (HVY) (-), ASLT HEL CO (LT) (-), AVN MAINT CO (AVUM/AVIM) (-), ASLT HEL CO (-), ATK HEL CO (LT) (-)

K–8. COORDINATION

Liaison is an integral part of C² for the ARSOA commander. Direct liaison by the air mission commander (AMC) and aircrews with supported and supporting units are required. Immediately following mission alert, the AMC and his mission planners work with the supported SOF—usually at the forward operational base—throughout the planning process. This standard procedure ensures that ARSOA's capabilities,

operational considerations, and support requirements are incorporated into the plan.

K–9. OPERATIONS

a. Special operations principles are an important part of SO mission planning. The SO principles for ARSOA are given below.

(1) Integrate supporting ARSOA assets from the time the mission is initially analyzed, the course of action is determined, and until the mission is completed.

(2) Increase ARSOA effectiveness by using the tactical and logistic capabilities of other services and nations.

(3) Use near–real–time and all–source intelligence products during planning, rehearsal, and execution.

(4) Suppress hostile acquisition means and weapon systems before and during the mission.

(5) Employ the element of surprise by—

- Conducting operations at night and during periods of low, ambient light.
- Using deception measures.
- Using terrain–following techniques.
- Using the range capability to alter approaches.
- Controlling or reducing electronic emissions during the mission.

(6) Concentrate SOF at the critical time by using precision timing and navigation.

(7) Maintain the ability to operate continuously.

b. ARSOA assets are not intended to provide aviation general support (GS) to SOF. Aviation GS should be coordinated through GP aviation forces in theater.

K–10. MISSION PLANNING

a. ARSOA planners and the personnel who will execute the mission must be brought into the planning process from the beginning. Political considerations and changing threats figure prominently in SO planning. Changes in political objectives or constraints may cause operational characteristics to change rapidly and significantly. Personnel who have not been involved during the entire process will not understand these changes and may put the success of the mission at risk. Detailed mission planning is vital to successful execution and to the survival of all SOF that take part in the mission. SO mission planning is distinctive in its degree of jointness, its dependence on operational intelligence, and the level of participation by mission personnel.

b. The basis of SO mission planning is to start at the target and plan all requirements in reverse order of execution. Typically, SO missions have a specific time–on–target (TOT); however, planners must verify, with the supported element, that there is a specific TOT or an event–driven requirement. When backward planning begins for a specific TOT, more variables must be considered and reconciled. Some examples of variables are airspace, friendly tactical air (TACAIR), refueling and recovery of aircrews and aircraft for follow–on missions. The levels of mission planning vary in time period, troops involved, and complexity.

<div align="center">

Appendix L

Mine Warfare Awareness

</div>

This appendix presents an overview of the need for mine warfare awareness. Landmines will continue to be a threat to future force projection operations and stability and support operations (SASO); therefore, it tells how to counter this threat and protect the force. It outlines aircrew procedures in the event of a forced landing in a suspected minefield.

L-1. OVERVIEW

Operation Restore Hope demonstrated the requirement to accurately predict, detect, remove, proof, mark routes clearly, and clear landmine areas during SASO. When they enter areas where others have fought, soldiers will encounter large numbers of unexploded ordnance; inevitably, they will operate in unmarked and uncleared mined areas. In Somalia, it was not unusual for children to bring unexploded ordnance to soldiers, nor was it uncommon for patrols to find minefields or caches of ammunition.

L-2. LANDMINES

Landmines will continue be a significant threat to future force projection operations and SASO. In every major peacekeeping arena from Cambodia to Bosnia, mines and fabricated explosives continue to take a toll on troops and civilians. To help counter this threat, units should—

a. Train soldiers how to detect, remove, mark routes clearly, proof, and to operate in landmine areas. Develop unit drills for dealing with mines and unexploded ordnance.

b. Consider that heavy mine-clearing capability—such as mine plows and mine clearing line charges (MICLCs)—may not be appropriate during SASO when main supply route (MSR) road surfaces should not be destroyed.

c. Exploit human intelligence (HUMINT) as a good source of information for suspected minefield locations.

d. Look for signs of mining activities, which include dead animals, craters, blown vehicles, disturbed soil, etc.

L-3. MINE AND BOOBYTRAP AWARENESS

Mine and boobytrap education for soldiers deploying to foreign countries is one of our greatest challenges. There are more than 2,700 different types of mines and fuse combinations in the world today. Landmines and boobytraps are a constant threat during peacekeeping and peace enforcement operations. The following are guidelines for protecting the force against mines and boobytraps:

a. All soldiers need to know how to identify, mark, and report the presence of minefields.

b. Expect constant changes in local mine warfare techniques.

c. Never attempt to disarm a landmine; report its location through your chain of command.

d. Do not move over the most obvious and easiest ground without first checking it for mines.

e. Never pull, or cut any wire, taut or slack, without first examining both ends. It is preferable that you do not touch the wire while examining it.

f. In convoys, the lead vehicle should proof the route of march. Use sand bags, flak vests, steel plates, or lumber to protect crew. Limit the number of personnel in the vehicle.

g. A mine or suspicious object immediate action drill is—

    (1) Warn those in the immediate vicinity.

    (2) Determine the limits of the minefield.

    (3) Mark the limits of the minefield.

    (4) Report to higher.

    (5) Avoid.

h. In areas that may be mined, always move with eyes open and treat with suspicion any object, natural or artificial, that appears out of place in its surrounding. If a soldier is wounded from a mine, use the following casualty immediate action drill:

    (1) One person clears a route to the casualty.

    (2) *Look, probe, detect.*

    (3) Clear the area immediately around the casualty.

    (4) Administer essential first aid.

    (5) Remove the casualty from the minefield using a cleared route.

    (6) Administer additional first aid.

    (7) Evacuate the casualty as soon as possible.

L-4. AIRCREW PROCEDURES

a. As part of their mission planning, crewmembers must update mine obstacle information on their maps. Consideration must be given to landing sites available (paved roads, cleared sites, etc.) in the event of a forced landing along the route of flight.

b. In the event of a forced landing in a contested area that has not been confirmed as being clear of mines the crew must—

(1) Remain in the aircraft (unless fire, injury, or threat situation dictate otherwise).

(2) Minimize movement inside the aircraft.

(3) Pass the condition of the aircraft and crew to the controlling agency.

(4) Standby for evacuation instructions.

c. If the threat situation and the nearest safe landing area are known, the crew should also include this information in their radio call for the recovery/mine clearing team.

d. As a precaution, aircraft should not hover over known or suspected minefields. Rotor wash can detonate a variety of mines, which can cause injury to the crew, as well as aircraft damage.

L-5. SUMMARY

The ultimate objective of all commanders is to accomplish the mission with minimal loss of personnel, equipment, and supplies. Despite peace agreements, soldiers face the prospect of confronting armed belligerents who only respond to the threat, or use, of force. The constant threat of violence demands necessary countermeasures to protect the force. The US Army Aviation Center (USAAVNC) will continue to update this appendix with emerging doctrine and lessons learned as they become available.

Glossary

ACRONYMS AND ABBREVIATIONS

A   air

a   assistant

AA   assembly area

AAA   antiaircraft artillery

A^2C^2 Army airspace command and control

AADC   Area Air Defense Commander

AAFARS   advanced aviation forward area refueling system

AAFES   Army and Air Force Exchange Service

A&L   administration and logistics

aaslt   air assault

AATF   air assault task force

AATFC   air assault task force commander

ABCS   Army Battle Command System

ABMOC   air battle management operations center

abn   airborne

AC   aircraft

ACA   airspace control authority; airspace control area

ACC   air component commander

ACCS   Army command and control system

ACE   analysis and control element

acft   aircraft

ACO   airspace control order

ACofS   Assistant Chief of Staff

ACP   airspace control plan

ACR   armored cavalry regiment

ACT   air cavalry troop

acty   activity

ACUS   Area Common User System

AD   air defense

ADA   air defense artillery

ADC   area damage control

ADCOORD   air defense coordinator

ADIZ   air defense identification zone

adj   adjustment

admin   administrative

ADP   automatic data processing

ADPC   Automatic Data Processing Center

ADPE   automatic data processing equipment

AE   aerial exploitation

AEB   aerial exploitation battalion

AFATDS   Advanced Field Artillery Tactical Data System

AFSO   Air force staff officer; aerial fire support observer

AG   Adjutant General

AGL   above ground level

AGPU   aviation ground power unit

AH   attack helicopter

AHB   assault helicopter battalion

AHC   assault helicopter company

AI   air interception

AIMI   aviation intensive management items

ALO   air liaison officer

ALOC   air lines of communication; administrative and logistics center

ALSE   aviation life support equipment

alt   alternate

altstg   altimeter setting

AM   amplitude modulated

AMC   air mission commander; aviation maintenance company

AMO   aviation materiel officer

ammo   ammunition

AMPS   Aviation Mission Planning System

anal   analyst

ANGLICO   air and naval gunfire liaison company

AO   area of operations

AOC   air operations center

AOE   Army of Excellence

APOD   air port of debarkation

APP   allied procedures publication

approx   approximately

APU   auxiliary power unit

AR   Army regulation

ARFOR   Army force

ARL   aerial reconnaissance low

armt   armament

ARNG   Army National Guard

ARS   air reconnaissance squadron

ARSOA   Army special operations aviation

ARSOTF   Army special operations task force

ARTEP   Army Training and Evaluation Program

arty   artillery

ASAC   all–source analysis center

ASARS   advanced synthetic aperture radar system

ASAS   All Source Analysis System

ASB   ammunition support battalion; aviation support battalion

ASCC   air support coordination center; Army Service component commander

ASCE   air support coordination element

ASE   aircraft survivability equipment

ASG   area support group

ASL   authorized stockage list

ASOC   air support operations center

ASP   ammunition supply point

ASPS   all–source production section

assoc   associated

asst   assistant

ASWO   assistant staff weather officer

AT   antitank

ATA   air to air

ATACMS   Army tactical missile

ATAF   allied tactical air force

ATC   air traffic control

ATCCS   Army Tactical Command and Control System

ATGM   antitank guided missile

atk   attack

ATKBN   attack battalion

ATKHB   attack helicopter battalion

ATKHC   attack helicopter company

ATM   advanced trauma management

ATO/SPINS   air tasking order/special instruction

ATOC   allied tactical operations center

ATP   ammunition transfer point

ATS   air traffic services

attn   attention

auth   authorized

autm   automation

autmv   automotive

aux   auxiliary

AVGAS   aviation gasoline

AVIM   aviation intermediate maintenance

avn   aviation

AVUM   aviation unit maintenance

AWACS   Airborne Warning and Control System

AWS   Air Weather Service

BAI   battlefield air interdiction

BCC   battlefield circulation control

BCD   battlefield coordination detackment

BCE   battlefield coordination element

BDA   battle damage assessment

bde   brigade

BDZ   base defense zone

BHL   battle handover line

BICC   battlefield information coordination center

BII   basic issue item

blk   block

BLSA   basic load storage area

BMNT   beginning of morning nautical twilight

bn   battalion

BOS   battlefield operation system

BP   battle position

br   branch

BRRP   brigade (or battalion) rapid refueling point

BSA   brigade support area

BSO   brigade signal officer

btry   battery

c   cargo airplane

C^2 command and control

c^2w command and control warfare

C^2SRS command and control strength reporting system

C^2I command, control, and intelligence

C^3 command, control, and communications

C^3CM command, control, communications, and countermeasures

C^4 command, control, communications, and computers

C^4I command, control, communications, computers, and intelligence

CA   civil affairs

CAB   command aviation battalion

CAC   command aviation company

C&J   collection and jamming

CAS   close air support (Air Force); close in fire support

CASEVAC   casualty evacuation

cav   cavalry

CB   chemical biological

cbt   combat

CCIR   commander's critical requirements

CCR   closed–circuit refueling

CCT   combat control team

cdr   commander

CE   communications–electronics; crewchief

CESI   communications–electronics standing instruction

CEWI   combat electronic warfare and intelligence

CFSC   corps finance support center

CG   center of gravity

cGy   centigray (radiation measurement)

CH   chaplain; cargo helicopter

CHEMO   chemical officer

CHS   combat health support

CI   counterintelligence

CINC   commander in chief

CK   cyanogen chloride

cl   class

CLGP   cannon–launched guided projectile

cmd   command

cmdt   commandant

CM&D   collection, management, and dissemination

cml   chemical

CMMC   corps materiel management center

CMO   civil–military operations

co   company

COA   course of action

coll   collection

COMARFOR   commander, Army forces

COMINT   communications intelligence

COMJAM   communications jamming

comm   communications

COMMZ   communications zone

comp   component

compo   composite

COMSEC   communications security

CONEX   container express

CONOPS   continuous operations

CONPLAN   concept plan

CONUS   continental United States

COOP   continuity of operations plan

coord   coordinate

COSCOM   corps support command

CNR   combat net radio

cm   centimeter

CP   command post

CRAF   Civil Reserve Air Fleet

CS   combat support

CSA   corps storage area; corps support area

CSAB   combat support aviation battalion

CSAR   combat search and rescue

CSG   corps support group

CSM   command sergeant major

CSR   controlled supply rate

CSS   combat service support

CSSCS   Combat Service Support ControlSystem

CST   combat support troop

CT   counterterrorist

CTA   common table of allowances

CTOC   corps tactical operations center

ctr   center

ctrl   control

CTT   commander's tactical terminal

CUCV   commercial utility cargo vehicle

CUV   commercial utility vehicle

CV   cruise vehicle

CW   chemical warfare

CZ   combat zone

DA   density altitude; Department of the Army

DAO   division ammunition officer

DASB   division aviation support battalion

DCofS   Deputy Chief of Staff

DCSPER   Deputy Chief of Staff for Personnel

decon   decontamination

def   defense

det   detachment

DF   direction finding

DISCOM   division support command

div   division

DIVARTY   division artillery

DLA   Defense Logistics Agency

DLQ   deck landing qualification

DMMC   division materiel management center

DNVT   digital nonsecure voice terminal

DOCC   deep operations coordination cell

DOD   Department of Defense

DOL   Director of Logistics

DOT   Department of Transportation

dpt   depart

DPTM   Directorate of Plans, Training, and Mobilization

DPW   Directorate of Public Works

dpt   depart

DRB   division–ready brigade

DRRP   division rapid refueling point

DS   direct support

DS2   decontaminating solution 2

DSA   division support area

dspo   disposal

DSS   direct support system

DST   decision support template

DSU   direct support unit

DT   demanding task

DTG   date–time group

DTOC   division tactical operations center

DVA   diverse vector area; dynamic visual acuity

dvr   driver

DZ   drop zone

EA   engagement area; each; electronic attack

EAC   echelons above corps

EACAS   Enhanced Cobra/TOW Armament System

EACIC   echelons above corps and intelligence center

ECAP   Army Environmental Compliance Achievement Program

ECCM   electronic counter–countermeasures

ech   echelon

ECM   electronic countermeasures

ECWCS   Extended Cold Weather Clothing System

ED   Environmental Division

EENT   end of evening nautical twilight

eff   effective

EH   electronic helicopter

EIR   essential intelligence requirement

elct   electronic

ELINT   electronic intelligence

elm   element

EMCON   emergency condition

EMNT   end of morning nautical twilight

EMP   electromagnetic pulse

engr   engineer

enl   enlisted

EOC   emergency operations center

EOD   explosive ordnance disposal

EODC   explosive ordnance disposal center

EOM   end of mission

EP   electronic protection

EPA   Environmental Protection Agency

EPLRS   Enhanced Position Location Reporting System

EPW   enemy prisoner of war

equip   equipment

ERFS   extended range fuel system

ESM   electronic warfare support measures

ESSS   external stores support system

ETAC   enlisted terminal attack controller

EW   electronic warfare

EXJAM   expendable jammer

FA   field artillery

FAA   forward assembly area

FAAD   forward area air defense

FAAO   field artillery air observer

FAAR   forward area alerting radar

FAC   forward air controller

FAC–A   forward air controller–airborne

FAIO   field artillery intelligence officer

FARE   forward area refueling equipment

FARP   forward arming and refueling point

FASCAM   family of scatterable mines

FASCO   forward area support coordinator

fax   facsimile

FCC   flight coordination center

FE   flight engineer

FEBA   forward edge of the battle area

FID   foreign internal defense

FIST   fire support team

fld   field

FLIR   forward–looking infrared radar

FLOT   forward line of own troops

flt   flight

FM   frequency modulated; field manual

FMC   fully mission capable

FMCP   fuel management control panel

FM(S)   frequency modulated (secure)

FOB   forward operations base

FOC   flight operations center

FOD   foreign object damage

FORSCOM   United States Army Forces Command

FRAGO   fragmentary order

FROG   free rocket over ground

FS   fire support

FSB   forward support battalion

FSCL   fire support coordination line

FSCOORD   fire support coordinator

FSE   fire support element

FSO   fire support officer

FSS   fire support section

FSSE   forward service support element

FST   finance support team

FSU   finance support unit

ft   foot; feet

FTI   fixed target indicator

FTX   field training exercise

func   function

FUP   forward unit position

fwd   forward

G1   Assistant Chief of Staff, G1 (Personnel)

G2   Assistant Chief of Staff, G2 (Intelligence)

G3   Assistant Chief of Staff, G3 (Operations and Plans)

G4   Assistant Chief of Staff, G4 (Logistics)

G5   Assistant Chief of Staff, G5 (Civil Affairs)

GCU   gas charging unit

GEMSS   ground emplaced mine scattering system

gen   general

gnd   ground

GOB   ground order of battle

gp   group

GP   general purpose

GPH   gallons per hour

GPM   gallons per minute

GPS   global positioning system

grd   ground

GS   general support

GSAB   general support aviation battalion

GSE   ground support equipment

GSM   ground station module

GSR   ground surveillance radar

GS–R   general support–reinforcing

GSU   ground support unit

GTA   graphic training

GVO   green vinyl overshoe

HA   holding area

HAC   helicopter aircraft commander

HARRP   helmet assembly, rearming refueling personnel

HAZCOM   hazardous program

HAZMIN   hazardous waste minimization

HE   high explosive

HEED   helicopter emergency egress device system

hel   helicopter

HEMAT   heavy expanded mobility ammunition trailer

HEMTT   heavy expanded mobility tactical truck

HF   high frequency; Hellfire

HHB   headquarters and headquarters battalion

HHC   headquarters and headquarters company

HHD   headquarters and headquarters detachment

HHT   headquarters and headquarters troop

HIDACZ   high-density airspace control zone

HIMAD   high–to–medium altitude air defense

HMMWV   high mobility multipurpose wheeled vehicle

HN   host nation

HNS   host nation support

HPT   high–payoff target

HPTL   high–payoff target list

hr   hour

HRO   humanitarian relief organization

HQ   headquarters

HTARS   HEMTT tanker aviation refueling system

HUMINT   human intelligence

HVT   high–value target

hvy   heavy

HW   hazardous waste

IA   imagery analysis

IEW   intelligence and electronic warfare

IEWSE   intelligence and electronic warfare support element

IFF   identification, friend or foe (radar)

IFR   instrument flight rules

IGRV   improved Guardrail V

IHFR   improved high–frequency radio

illum   illumination

IMINT   imagery intelligence

in   inch

IN   infantry

ind   individual

indef   indefinite

info   information

INMARSAT   International Maritime Satellite

int   intelligence

intcp   interception

intel   intelligence

intg   interrogation

INTREP   intelligence report

INTSUM   intelligence summary

invt   inventory

IPB   intelligence preparation of the battlefield

IPF   integrated processing facility

ir   infrared

IR   intelligence report

ISB   initial staging base

ISOPREP   isolation preparation packet

ITO   installation transportation officer

J   joint

J3   Operations Directorate

JAAT   joint air attack team

JAG   Judge Advocate General

JCS   Joint Chiefs of Staff

JFACC   joint force air component commander

JFC   joint force commander

JFLCC   joint force land component commander

JP   jet petroleum

JP4   jet petroleum, grade 4

JP8   jet petroleum, grade 8

JSEAD   joint suppression of enemy air defenses

JSOCC   Joint Force Special Operations Air Component Commander

JSOTF   Joint Special Operations Task Force

JSRC   Joint Search and Rescue Center

JSTARS   Joint Surveillance Target Attack Radar System

JTF   joint task force

km   kilometer

kph   kilometer per hour

kt   knot

LCC   land component commander

LCSU   logistics composite support unit

LD   line of departure

LHA   landing helicopter assault

LIC   low–intensity conflict

LID   light infantry division

LLAD   low–level air defense

LLTR   low–level transit route

LNO   liaison officer

LO   liaison operation

LOC   lines of communication

log   logistics

LOGO   logistics order

LOGOS   logistics operations

LOGPAC   logistics package

LOI   letter of instruction

LOS   line of sight

LPH   landing platform helicopter

LPI   low probability of interception

LPU   limited production—urgent

LRP   logistics release point

LRSU   long–range surveillance unit

LSA   logistics support area

lt   light

LUH   light utility helicopter

LZ   landing zone

LZA   landing zone area

MACOM   major Army command

maint   maintenance

MANPADS   man–portable air defense

mat   materiel

max   maximum

MBA   main battle area

MCA   movement control agency

MCC   movement control center

MCS/P   maneuver control system/PHOENIX

MDCI   multidiscipline command intelligence

mdm   medium

mech   mechanized

med   medical

MEDEVAC   medical evacuation

MET   missile escort team

METL   mission essential task list

METT–T   mission, enemy, terrain, troops, and time available

mgt   management

MHB   medium helicopter battalion

MHE   materials handling equipment

MI   military intelligence

MIA   missing in action

MICLIC   mine–clearing mine charge

MILGROUP   military group

MILVAN   military–owned demountable container

min   ministry; minimum

MLRS   multiple launch rocket system

mm   millimeter

MMC   materiel management center

MOA   memorandum of agreement

MOGAS   motor gasoline

MOPP   mission–oriented protective posture

MOS   military occupational specialty

MOU   memorandum of understanding

MOUT   military operations on urbanized terrain

mov   movement

MP   military police

MRE   meal ready to eat

MRL   multiple rocket launcher

MRO   materiel release order

MRR   minimum risk route

MSB   main support battalion

MSD   minimum safe distance

MSE   mobile subscriber equipment

msg   message

msl   missile

msn   mission

MSR   main supply route

MSRT   mobile subscriber radiotelephone

MST   maintenance support team

MTI   moving target indicator

MTOE   modification table(s) of organization and equipment

MTP   maintenance test pilot; mission training program

mtr   mortar

MULO   multipurpose light overshoe

MUSARC   Major United States Army Reserve Command

MWR   morale, welfare, and recreation

NAAK   nerve agent antidote kit

NAI   named area of interest

NASP   National Airspace System Plan

NATO   North Atlantic Treaty Organization

NAVAID   navigational aid

NBC   nuclear, biological, chemical

NBCWRS   NBC warning and reporting system

NC   node center

NCA   national command authority

NCO   noncommissioned officer

NCOIC   noncommissioned officer in charge

NCS   net control station

NDB   nondirectional radio beacon

NEW   net explosive weight

NGF   naval gunfire

NGLO   naval gunfire liaison officer

NICP   national inventory control point

NLT   not later than

no   number

NOE   nap–of–the–earth

noncom   noncommunication

NRB   Natural Resources Branch

NSN   national stock number

NTE   not to exceed

NVD   night vision device

NVG   night vision goggles

NVS   night vision systems

obj   objective

OCONUS   outside continental United States

OEG   operational exposure guidance

ofc   office

off   officer

OH   on hand; observation helicopter

O&I   operations and intelligence

OIC   officer in charge

op   operation

OPCOM   operational command

OPCON   operational control

OPLAN   operation plan

OPORD   operation order

ops   operations

OPSEC   operations security

OPTEMPO   operational tempo

OR   operational readiness

ord   ordnance

orgn   organization

ORI   operational readiness inspection

OST   order ship time

OV   orbiting vehicle

PA   pressure altitude

P&A   personnel and administration

PAC   Personnel and Administration Center

PC   pilot in command

PD   performance degraded

pers   personnel

petrol   petroleum

Ph   probability of hit

photo   photograph

PIR   priority intelligence requirement

PL   phase line

PLL   prescribed load list

PLS   personnel location system

plt   platoon

PMC   partially mission capable

PMCS   preventive maintenance checks and services

PNL   prescribed nuclear load

POC   point of contact

POD   port of debarkation

POE   port of embarkation

POL   petroleum, oil, and lubricants

POM   preparation for oversea movement (units)

POR   preparation of replacements for overseas movement

PP   passage point

ppm   parts per mission

proc   processing

prod   production

prog   program

prop   property

PS   personnel services

PSC   personnel service company

psi   pounds per square inch

PSS   personnel service support

pwr   power

PSYOP   psychological operations

PWRS   pre–positioned war reserve stock

PZ   pickup zone

QA   quality assurance

QL   Quick Look

qty   quantity

RAOC   rear area operations center

RASA   ready ammunition storage area

RATT   radio teletypewriter

RAU   radio access unit

RC   reconnaissance cargo

RCC   rescue coordination center

RDF   radio direction finder

RDTE   research, development, test, and evaluation

regt   regiment

regtl   regimental

rep   representative

RETRANS   retransmission

rfl   rifle

RFL   restrictive fire line

rkt   rocket

RL   readiness level

ROA   restricted operations area

ROE   rules of engagement

RP   release point

ROZ   restricted operations zone

rpr   repair

RPM   revolutions per minute

RPV   remotely piloted vehicle

rqmt   requirement

RSR   required supply rate

RTD   Resident Training Division

RTO   rear tactical operations

RTOC   rear tactical operations center

RU   reconnaissance utility

S1   adjutant (US Army)

S2   intelligence officer (US Army)

S3   operations and training officer (US Army)

S4   supply officer (US Army)

SAAFR   standard Army aircraft flight route

SAC   support aviation company

SAM   surface–to–air missile

SAR   search and rescue

SASO   stability and support operations

S&S   supply and service

SATCOM   satellite communications

SB   supply bulletin

SCC   system control center

SEAD   suppression of enemy air defenses

sec   section

SEMA   special electronic mission aircraft

SEN   small extension node

SERE   survival, evasion, resistance, and escape

SF   Special Forces

SFOB   Special Forces Operational Base

sgt   sergeant

SHORAD   short–range air defense

SICPS   signal intelligence command post system

SIDPERS   Standard Installation/Division Personnel System

SIF   selective identification feature

SIGINT   signals intelligence

SIGO   signal officer

SIGSEC   signals security

SINCGARS   single channel ground airborne radio system

sit   situation

SITREP   situation report

SJA   staff judge advocate

SLAR   side–looking airborne radar

SLOC   sea lanes of communication

SMCT   soldier's manual of common tasks

SO   special operations

SOA   special operations aviation

SOC   special operations command

SOF   special operations forces

SOI   signal operating instructions

SOP   standing operating procedure

SOR   specific orders and requests

sp   specialist

SP   start point or self–propelled

spec   special; specialist; specific

SPO   security, plans, and operations

SPOD   sea port of embarkation

SPOTREP   spot report

spt   support

sqd   squad

sr   senior

SR   special reconnaissance

SRC   standard requirements code

SSB   single sideband

SSSC   self-service supply center

SSM   surface–to–surface missile

STB   supertropical bleach (caustic decontaminant)

std   standard

STP   soldier training publication

STRIKWARN   strike warning

SUA   special use airspace

subj   subject

subs   substitute

sup   supply

SUPCOM   support command

surve   surveillance

svc   service

SWO   staff weather officer

synch   synchronize

sys   system

T2   tricothecene toxin

TA   theater Army; tank Army (Soviet)

TAA   theater Army area

TAACOM   theater Army area command

TAADS   The Army Authorization Documents System

tac   tactical

TAC   tactical air coordinator

TAC(A)   tactical air coordinator (airborne)

TACAIR   tactical air

TACC   tactical air control center

TACCS   Tactical Army CSS Computer System

TACFIRE   tactical fire

TACJAM   tactical jamming

TACOPS   tactical operations

TACP   tactical air control party

TACS   tactical air control system

TACSAT   tactical satellite

TADS   target acquisition and designation system

TAF   tactical airforce

TAI   tactical areas of interest

TAMCA   Theater Army Movement Control Authority

TAMMC   Theater Army Materiel Management Center

TARP   target acquisition reconnaissance platoon

TASOC   Theater Army Special Operations Command

TC   training circular

TCAE   technical control and analysis element

TCC   transportation coordination center

TCC(A)   transportation coordination center (air)

TCF   tactical combat force

TDA   theater defense aviation

TDAB   theater defense aviation battalion

TDMP   tactical decision–making process

TDY   temporary duty

tech   technician or technical

TEL   transponder erector launcher

temp   temperature

TENCAP   tactical exploitation of national space capabilities

TF   task force

TFU   tactical forecast unit

tgt   target

THREATCON   threat condition

tk   tank

tm   team

TM   technical manual

TMD   theater missile defense

TMO   transportation movement office

TMT   transportation motor transport

TOC   tactical operations center

TOE   table(s) of organization and equipment

tot   total

TOT   time–on–target

TOW   tube–launched, optically tracked, wire–guided (missile)

TPU   tank and pump unit

TR   tactical reconnaissance

TRADOC   United States Army Training and Doctrine Command

trans   transportation

TRANSCOM   transportation command

trk   truck

trn   train

TRP   target reference point

trp   troop

TSA   theater storage area

TTP   tactics, techniques, and procedures

TV   television

TVAP   target value analysis process

U   utility airplane

UAV   unmanned aerial vehicle

UH   utility helicopter

UHF   ultra high frequency

UMCP   unit maintenance collection point

UMT   unit ministry team

US   United States (of America)

USAF   United States Air Force

USAR   United States Army Reserve

USN   United States Navy

UT   undemanding task

UW   unconventional warfare

veh   vehicle

VERTREP   vertical replenishment

VFR   visual flight rules

VHF   very high frequency

vic   vicinity

VMF   Variable Message Format

VTDP   vectoring and target designating point

w   with

WETM   weather team

WO   warrant officer

wpn   weapon

wx   weather

XO   executive officer

Z   zulu (Greenwich Mean Time)

REFERENCES

Army Regulations

AR 30–7	Operational Rations, 1 March 1979. (DLAR 4145.36)
AR 95-1	Army Aviation: Flight Regulations, 30 May 1990.
AR 200–1	Environmental Protection and Enhancement. 23 April 1990.
AR 200–2	Environmental Effects of Army Actions, 23 December 1988.
AR 351–1	Individual Military Education and Training, 15 October 1987.
AR 385–64	Ammunition and Explosives Safety Standards, 22 May 1987.
AR 385–95	Army Aviation Accident Prevention, 20 May 1991.
AR 500–60	Disaster Relief, 1 August 1988.
AR 525-90	Wartime Search and Rescue (SAR) Procedures, 25 February 1985.
AR 600–20	Army Command Policy, 30 March 1988.

Army Training and Evaluation Program

ARTEP 1–100–30–MTP	Mission Training Plan for the Headquarters and Headquarters Company Aviation Brigade and Battalion, 6 December 1991.

Defense Logistics Agency Regulation

DLA Regulation 4145.36	Operational Rations, 1 March 1979

Department of the Navy Publications

NAEC–ENG–7576	Shipboard Aviation Facilities Resume, 1 January 1996.
NAVSEA OP–4	Ammunition Afloat, 15 February 1972.

Field Manuals

FM 1–100	Army Aviation Operations, 21 February 1997.
FM 1–101	Aviation Battlefield Survivability, 5 December 1990.
FM 1–108	Doctrine for Army Special Operations Aviation Forces, 3 November 1993.
FM 1–109	Aviation Self–Deployment Planning, 29 May 1987.
FM 1–112	Tactics, Techniques, and Procedures for the Attack Helicopter Battalion, 21 February 1991.
FM 1–113	Assault Helicopter Battalion, 28 October 1986.
FM 1–114	Tactics, Techniques, and Procedures for the Regimental Aviation Squadron, 20 February 1991.
FM 1–116	Tactics, Techniques, and Procedures for the Air Cavalry/Reconnaissance Troop, 20 February 1991.
FM 1-117	Air Reconnaissance Squadron, 30 May 1989.
FM 1–120	Air Traffic Services Contingency and Combat Zone Operations, 22 May 1995.
FM 1–500	Army Aviation Maintenance, 27 January 1995.
FM 1–513	Battlefield Recovery and Evacuation of Aircraft, 20 May 1993.
FM 1–564	Shipboard Operations, TBP.
FM 3–3	Chemical and Biological Contamination Avoidance, 16 November 1992.
FM 3-3-1	Nuclear Contamination Avoidance, 9 September 1994.

FM 3-4	NBC Protection, 29 May 1992.
FM 3-9	Potential Military Chemical/Biological Agents and Compounds, 12 December 1990.
FM 5–100	Engineer Operations, 27 February 1996.
FM 6–20	Fire Support in the Airland Battle, 17 May 1988.
FM 8-9	NATO Handbook on the Medical Aspects of NBC Defensive Operations AmedP6(B), 1 February 1996.
FM 8–10–6	Medical Evacuation in a Theater of Operations, Tactics, Techniques, and Procedures, 31 October 1991.
FM 8–285	Treatment of Chemical Agent Casualties and Conventional Military Chemical Injuries, 22 December 1995.
FM 9–6	Munitions Support in Theater of Operations, 1 September 1989.
FM 9–16	Explosive Ordnance Reconnaissance, 30 July 1981.
FM 10–68	Aircraft Refueling, 29 May 1987.
FM 10–69	Petroleum Supply Point Equipment and Operations, 22 October 1986.
FM 10-70	Inspecting and Testing Petroleum Products, 9 May 1983.
FM 10–71	Petroleum Tank Vehicle Operations, 12 May 1978.
FM 11–50	Combat Communications Within the Division (Heavy and Light), 4 April 1991.
FM 12–6	Personnel Doctrine, 9 September 1994.
FM 17–95	Cavalry Operations, 19 September 1991.
FM 19-1	Military Police Support for the Airland Battle, 23 May 1988.
FM 20–3	Camouflage, 14 November 1990.
FM 20–22	Vehicle Recovery Operations, 18 September 1990.
FM 21–60	Visual Signals, 30 September 1987.
FM 21–11	First Aid for Soldiers, 17 October 1988.
FM 22–9	Soldier Performance in Continuous Operations., 12 December 1991.
FM 34–1	Intelligence and Electronic Warfare Operations, 27 September 1994.
FM 34–3	Intelligence Analysis, 15 March 1990.
FM 34–7	Intelligence and Electronic Warfare Support to Low–Intensity Conflict Operations, 18 May 1993.
FM 34–10	Division Intelligence and Electronics Warfare Operations., 25 November 1986.
FM 34–60	Counterintelligence, 3 October 1995.
FM 34–80	Brigade and Battalion Intelligence and Electronic Warfare Operations, 15 April 1986.
FM 34–81	Weather Support for Army Tactical Operations, 31 August 1986.
FM 34–130	Intelligence Preparation of the Battlefield, 8 July 1994.
FM 44–8	Small Unit Self–Defense Against Air Aattack, 30 December 1981.
FM 44-64	SHORAD Battalion and Battery Operations, 5 June 1997.
FM 44–100	US Army Air Defense Operations, 15 June 1995.
FM 54–30	Corps Support Groups, 17 June 1993.
FM 55–9	Unit Air Movement Planning, 5 April 1993.

FM 55–20	Army Rail Transport Units and Operations, 31 October 1986.
FM 55–30	Army Motor Transport Units and Operations, 14 March 1980.
FM 55–450–3	Multiservice Helicopter External Air Transport: Basic Operations and Equipment, 11 February 1991.
FM 63–2	Division Support Command, Armored, Infantry, and Mechanized Infantry Divisions, 20 May 1991.
FM 63–2–1	Division Support Command, Light Infantry, Airborne, and Air Assault Division, 16 November 1992.
FM 63–21	Main Support Battalion, 7 August 1990.
FM 63–23	Aviation Support Battalion, 6 June 1996.
FM 71–3	The Armored and Mechanized Infantry Brigade, 8 January 1996.
FM 71–100	Division Opeations, 28 August 1996.
FM 90-2	Battlefield Deception, 3 October 1988.
FM 90–12	(Base Defense) Multi–Service Procedures for Defense of a Joint Base., 2 October 1989.
FM 90-18	(CSAR) Multi-Service Procedures for Combat Search and Rescue, 31 May 1991.
FM 90–21	(JATT) Multi–Service Procedures for Joint Air Attack Team Operations, 16 October 1991.
FM 100-1	The Army, 14 June 1994.
FM 100–5	Operations, 14 June 1993.
FM 100–6	Information Operations (Draft/TBP).
FM 100–12	US Army Theater Missile Defense Operations.
FM 100–15	Corps Operation, 13 September 1989.
FM 100–16	Army Operational Support, 31 May 1995.
FM 100–17	Mobilization, Deployment, Redeployment, and Demobilization, 28 October 1992.
FM 100–19	Domestic Support Operations, 1 July 1993.
FM 100–20	Military Operations in Low Intensity Conflict (AFP 3-20), 5 December 1990.
FM 100–103	Army Airspace Command and Control in a Combat Zone, 7 October 1987.
FM 101–5	Staff Organization and Operations, 25 May 1984.
FM 101–10–1/1	Staff Officers Field Manual - Organizational, Technical, and Logistical Data (Volume I), 7 October 1981.
FM 101–10–1/2	Staff Officers Field Manual - Organizational, Technical, and Logistical Data, Planning Factors (Volume 2) w/C1, 7 October 1987.
FM 101–31–1	Staff Officers' Field Manual for Nuclear Weapons Employment Doctrine and Procedures, 6 June 1986.

Joint Publications

JCS Pup 0–2	Unified Action Armed Forces (UNAAF), 24 February 1995.
JCS Pub 1–02	DOD Dictionary Military and Associated Terms with JMTGM changes, 23 March 1994.
JCS Pub 3–01.4	JTTP for Joint Suppression of Enemy Air Defenses, 25 July 1995.
JCS Pub 3–01.5	Doctrine for Joint Theater Missile Defense, 22 February 1996.

JCS Pub 3–13.1   Joint Doctrine for Command and Control Warfare (C^{2}W), 7 February 1996.
JCS Pub 3–50.2   Doctrine for Joint Combat Search and Rescue, 26 January 1996.
JCS Pub 3–50.21   Joint Combat Search and Rescue Tactics (Draft TBP).
JCS Pub 3–56.1   Command and Control for Joint Air Operations, 14 November 1994.

Memorandum of Understanding

Army/Air Force Deck Landing Operations Memorandum of Understanding (MOU), July 1988.

Soldier Training Publication

STP 21–1–SMCT   Soldiers' Manual of Common Tasks Skill Level 1, 1 October 1994.

Supply Bulletins

SB 710-2   Supply Control Combat Consumption Rates for Ground and Aviation Type Petroleum Products, 12 March 1993.

Technical Manuals

TM 1–1500–328–23   Aeronautical Equipment Maintenance Management Policies and Procedures, 28 February 1995.

TM 3–4240–280–10   Operator's Manual for Mask, Chemical–Biological: Aircraft, ABC–M24 and Accessories and Mask, Chemical–Biological, Tank, M25A1 and Accessories, 15 March 1988.

TM 9-1300-206   Ammunition and Explosives Standards, 30 August 1973.

TM 9–1340–222–20   Unit Maintenance Manual for 2.75–inch Low–Spin, Folding Fin Aircraft Rockets; 2.75–inch Spin Stabilized, Wrap Around Fin Aircraft Rockets; 66mm Light Antitank Weapon Systems; 3–5–inch Rockets; and M3A2E1. 3 September 1994.

TM 55–450–3   Air Transport of Supplies and Equipment: UH–1 Series Helicopters in Air Force Aircraft, 8 December 1965.

TM 55–1520–240–10   Operator's Manual for Army CH–47D, April 1992.

TM 55–1560–307–13&P   Operator Aviation Unit and Aviation Intermediate Maintenance Manual with Repair Parts and Special Tools List for Extended Range Fuse System Army Model CH–47 Helicopter Part Number 855DS–CC–D–0007–2 (NSN 1560–01–221–7600), 11 December 1990.

TM 750–244–3   Procedures for Destruction of Equipment to Prevent Enemy Use (Mobility Equipment Command), 23 September 1969.

Training Circular

TC 1-210   Aircrew Training Program Commander's Guide to Individual and Crew Standardization, 3 October 1995.

TC 5–400   Unit Leader's for Environmental Stewardship, 29 September 1994.

TC 12-16   PAC Noncommissioned Officer's Guide, 27 June 1991.

TC 22-6   The Army Noncommissioned Officer Guide, 23 November 1990.

Department of the Army Forms

DA Form 581   Request for Issue and Turn-in of Ammunition, August 1989.
DA Form 2404   Equipment Inspection and Maintenance Worksheet, 1 April 1979.
DA Form 2408–13-1   Aircraft Inspection and Maintenance Record, October 1991.
DA Form 2408–13–3   Aircraft Technical Inspection Worksheet, November 1991.

Department of Defense Forms

DD Form 1387-2   Special Handling Data/Certificate, June 1986.
DD Form 1833   Isolated Personnel Report, February 1984.